

**Results of Tagging and Biological
Studies in the Lower Mackenzie River,
Northwest Territories Conducted
During 1992 and 1993**

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2001

**Canadian Technical Report of Fisheries
and Aquatic Sciences 2387**



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Fisheries and Aquatic Sciences 2387

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MACKENZIE RIVER, NORTHWEST TERRITORIES CONDUCTED
DURING 1992 AND 1993**

by

J.A. Babaluk, R.J. Wastle, and M.A. Treble

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Cat. No. Fs 97-6/2387E ISSN 0706-6457

Correct citation for this publication is:

Babaluk, J.A., R.J. Wastle, and M.A. Treble. 2001. Results of tagging and biological studies in the lower Mackenzie River, Northwest Territories conducted during 1992 and 1993. Can. Tech. Rep. Fish. Aquat. Sci. 2387: viii + 80 p.

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ABSTRACT

Babaluk, J.A., R.J. Wastle, and M.A. Treble. 2001. Results of tagging and biological studies in the lower Mackenzie River, Northwest Territories conducted during 1992 and 1993. Can. Tech. Rep. Fish. Aquat. Sci. 2387: viii + 80 p.

During August and September, 1992, 101 broad whitefish and 12 Dolly Varden were T-bar tagged and released in the Mackenzie River near Aklavik, NT and during July and August, 1993, 1223 broad whitefish and 169 inconnu were tagged and released in the Mackenzie River near Horseshoe Bend. The tagging study was conducted to provide information on movements of the fish in the lower Mackenzie River. As of March 31, 2000, 13 broad whitefish and 1 Dolly Varden tagged at Aklavik and 23 broad whitefish and 13 inconnu tagged at Horseshoe Bend had been recovered. Based on tag returns, there was a tendency for broad whitefish that appeared to spawn in the Peel River to migrate along the western side of the Mackenzie River Delta. Broad whitefish and inconnu that appeared to spawn in the Arctic Red River and Mackenzie River between the Arctic Red River and the Ramparts Rapids tended to migrate through the middle and along the eastern side of the Mackenzie River Delta.

Eight other fish species were also caught during 1992 and 1993: lake whitefish, northern pike, Arctic cisco, least cisco, burbot, longnose sucker and pink salmon. Selected biological data for broad whitefish, inconnu, lake whitefish, northern pike and Dolly Varden caught during the study are analysed and presented. Biological information for all tagged fish is tabulated.

A pelvic fin ray was removed from each broad whitefish and inconnu tagged and released to determine the validity of ages derived from the fin rays. A second pelvic fin ray was removed at time of recovery. Oxytetracycline was injected into selected, tagged broad whitefish to determine the validity of ages derived from pelvic fins rays and otoliths. Both methods indicated that growth increments were laid down annually on broad whitefish otoliths and pelvic fin rays and inconnu pelvic fin rays. This demonstrated that the otolith and pelvic fin ray methods of age determination are valid.

Key words: broad whitefish; lake whitefish; Dolly Varden; northern pike; Mackenzie Delta; migrations; tagging; oxytetracycline; age validation.

RÉSUMÉ

Babaluk, J.A., R.J. Wastle, and M.A. Treble. 2001. Results of tagging and biological studies in the lower Mackenzie River, Northwest Territories conducted during 1992 and 1993. Can. Tech. Rep. Fish. Aquat. Sci. 2387: viii + 80 p.

Pendant les mois d'août et septembre 1992, 101 corégones tchirs et 12 Dolly Varden ont été marqués avec des étiquettes en T puis libérés dans le Mackenzie près d'Aklavik (T.N.-O.); en juillet et août 1993, 1223 corégones tchirs et 169 inconnus ont été marqués et libérés dans le Mackenzie près du Horseshoe Bend. Cette opération de marquage avait pour but de fournir de l'information sur les déplacements des poissons dans le cours inférieur du Mackenzie. Au 31 mars 2000, 13 corégones et 1 Dolly Varden marqués à Aklavik, et 23 corégones et 13 inconnus marqués au Horseshoe Bend, avaient été récupérés. D'après ce résultat, il semble que certains corégones tchirs frayent dans la rivière Peel et migrent du côté ouest du delta du Mackenzie. Les corégones tchirs et les inconnus qui semblent frayer dans la rivière Arctic Red, et dans le

Mackenzie entre le confluent de l'Arctic Red et les rapides Ramparts, migrent plutôt dans le centre et le long de la bordure est du delta du Mackenzie.

Des poissons appartenant à d'autres espèces ont également été capturés en 1992 et 1993 : grand corégone, grand brochet, cisco arctique, cisco sardinelle, lotte, meunier rouge et saumon rose. Des données biologiques choisies concernant le corégone tshir, l'inconnu, le grand corégone, le grand brochet et la Dolly Varden capturés pendant l'étude sont analysées et présentées. L'information d'ordre biologique sur tous les poissons marqués est présentée en tableaux.

Pour chaque corégone tshir et chaque inconnu marqué et libéré, on a prélevé un rayon de la nageoire pelvienne pour déterminer la validité des âges établis à partir des rayons de nageoire. Un deuxième rayon de pelvienne a été prélevé au moment de la récupération. On a injecté à certains corégones tshirs marqués de l'oxytétracycline pour déterminer la validité des âges établis à partir des rayons de pelvienne et des otolithes. Les deux méthodes ont indiqué que des couches de croissances se déposaient chaque année sur les otolithes et les rayons de pelvienne des corégones tshirs et sur les rayons de pelvienne des inconnus. Ce résultat démontre que les méthodes de détermination de l'âge par les otolithes et par les rayons de la nageoire pelvienne sont toutes deux valides.

Mots-clés: corégone tshir; grand corégone; Dolly Varden; grand brochet; delta du Mackenzie; migrations; marquage; oxytétracycline; validation de l'âge.

INTRODUCTION

The Inuvialuit and Gwich'in of communities on the lower Mackenzie River depend on fish from the river as a major source of food. Of these fish, broad whitefish, *Coregonus nasus*, is the most important in the local subsistence fisheries (Fabijan 1991; Treble 1996; Treble and Reist 1997). Although test or exploratory commercial fisheries for the species conducted in the past (Yaremchuk et al. 1989) have proven uneconomic (Anderson 1995), the broad whitefish fishery will always remain an important factor in maintaining traditional lifestyles (Tallman and Reist 1997). Although a commercial fishery for broad whitefish may not be viable, biological information about this fish and co-existing species is still required to conserve and manage the existing populations.

Fish population studies in the lower Mackenzie River region have been conducted intermittently in the past. Baseline studies were carried out in the early 1970's as part of the Mackenzie River Valley Pipeline Study (e.g., Hatfield et al. 1972) and other work, including tagging studies, was conducted during the 1980's as part of the Northern Oil and Gas Action Program (e.g., Chang-Kue and Jessop 1991). During 1992 and 1993, the Department of Fisheries and Oceans and the Inuvialuit Fisheries Joint Management Committee (FJMC) conducted a fish-tagging project in the Mackenzie River Delta in order to collect information on movements of fish in the lower Mackenzie River. Emphasis was placed on tagging and releasing broad whitefish but small numbers of inconnu, *Stenodus leucichthys*, and Dolly Varden, *Salvelinus malma*, were also tagged and released. Biological information was also collected from the broad whitefish and other species captured to add to the existing knowledge of area fish. The project also was designed to employ local beneficiaries and train them in various aspects of fisheries field biology so that they might lead or participate more actively in future fisheries related projects conducted in the Inuvialuit Settlement Region (ISR).

Whereas Babaluk et al. (1997) briefly described the tagging project carried out during 1992 and 1993 in the lower Mackenzie River, this report describes the project in greater detail (e.g., number and location of fishes tagged;

recovery information up to March 31, 2000). The report also summarises the biological information that was collected from the tagged and released fish as well as from other fishes caught during that period.

In conjunction with the tagging study, another study was initiated to validate broad whitefish and inconnu age determination methods. Validating methods of age determination is important for understanding the biology of targeted fish species. Without accurate ages, parameters such as growth rates, age at maturity and mortality and production estimates may be inaccurate (Beamish and McFarlane 1983). Broad whitefish and inconnu otoliths and pelvic fin rays exhibit clear patterns of growth increments. A growth increment is made up of one pair of opaque and translucent rings (Campbell and Babaluk 1979). The objective of this study was to determine whether the increments on the otoliths and fin rays were, in fact, annual (i.e., whether ages determined from these structures were accurate). Two methods to determine this are: 1) injecting a bone-marking compound, in this case the antibiotic oxytetracycline (OTC), into the fish so that a known time mark is deposited on bony structures such as otoliths and fin rays; and, 2) conducting a capture-mark-recapture study where an age is determined at time of capture (number of growth increments on the removed pelvic fin rays) and then an age is determined at time of recapture (number of growth increments on the remaining pelvic fin rays). Results of this study are presented.

The overall results of these studies will add to the existing information base on the fishes in the region so that sound conservation and management plans for the populations can be developed.

MATERIALS AND METHODS

FISHING METHODS

Between August 25 - September 7, 1992, broad whitefish and other fish species were captured near Aklavik, NT (68 13'N, 135 00'W; Fig. 1) along the Peel/West Channel of the Mackenzie River using floating gill nets. The nets were 23 m (75') long, 1.8 m (6') deep and were

composed of 114 mm (4.5") stretched measure, multi-filament nylon mesh. Nets were set in eddies with the majority of nets set at a bend in the West Channel, locally known as "Fish Point" (68 18'N, 135 10'W; Fig. 1). These surface nets were set perpendicular from shore using local, traditional methods. Net set duration was approximately 1 hr. Live-captured broad whitefish and Dolly Varden were removed from the gill nets and placed in a floating holding pen at shore where they were held until tagged. All other fish were removed from the gill nets, enumerated and released.

Between July 20 - August 21, 1993, broad whitefish and other fish species were captured near Horseshoe Bend (68 14'N, 134 19'W; Fig. 1) along the Middle Channel of the Mackenzie River, also, using floating gill nets. The nets were 50 m (165') or 100 m (330') long, 1.8 m (6') deep and made of 140 mm (5.5") stretched measure, multi-filament nylon mesh. The nets were set in eddies and were set in the same manner as at Aklavik the previous year. Net set duration was also approximately 1 hr. Live-captured broad whitefish and inconnu were removed from the gill nets and placed in a large holding tub containing fresh water in the boat where they were held until tagged. All other fish were removed from the gill nets, enumerated and released.

TAGGING AND SAMPLING METHODS

In 1992 at Aklavik, 101 broad whitefish and 12 Dolly Varden were captured, tagged and released. At the end of each day's gill netting operation, the broad whitefish and char held in the holding pen at shore were dip-netted out and anaesthetised in a tub containing a benzocaine solution (Laird and Oswald 1975) prior to tagging. The fish were weighed (nearest 10 g), measured for fork length (nearest mm), tagged (Hallprint TBA-2 T-bar anchor tag) and had the first two fin rays from the left pelvic fin clipped and collected for age determination (see Fig. 2). All tagged fish were returned to the holding pen and held overnight to recover. The fish were released the following morning.

At Horseshoe Bend in 1993, 1223 broad whitefish and 169 inconnu were captured, tagged and released. At Horseshoe Bend, the tagging procedure employed at Aklavik the previous year was modified to adapt to local conditions (e.g., greater current). Live gill-netted

broad whitefish and inconnu were placed directly into a tub, containing fresh water, in the boat. At the end of each net lift, the boat was driven to the middle of the channel and the fish were processed as they were at Aklavik in 1992, except anaesthetic was not used. As the fish were not anaesthetised, they were released immediately after processing. The majority of the fish recovered immediately and quickly swam out of sight. Those that were lethargic were recaptured and held in a tank of fresh water in the boat and were released when they were fully recovered.

At both tagging locations, all other species of fish that were caught in the gill nets were counted and, in some cases, measured and weighed before they were released. Any fish, including broad whitefish, found dead in the gill nets or that did not survive the tagging procedure were sampled for fork length, weight, sex, maturity and age.

Ages for all live-captured and released fish were determined from pelvic fin ray sections as described by Campbell and Babaluk (1979). Ages for all dead-sampled fish, except northern pike, *Esox lucius*, were determined from broken, polished and burnt otoliths as described by Chilton and Beamish (1982). Ages for northern pike were determined from cleithra as described by Harrison and Hadley (1979).

AGE VALIDATION METHODS

In addition to the tagging study, we attempted to validate the pelvic fin ray and otolith methods for determining ages of Mackenzie River broad whitefish and inconnu. All of the broad whitefish and inconnu captured, tagged and released at Aklavik in 1992 and Horseshoe Bend in 1993 had the first two (leading) rays of the left pelvic fin removed (see Fig. 2) and collected for an initial age determination (i.e., age-at-tagging). Any tagged fish recovered whole in subsequent years from the subsistence fishery in the lower Mackenzie River had the remaining pelvic fin rays removed for a final age determination (i.e., age-at-recapture). Fin ray sections were prepared and ages were determined as described by Campbell and Babaluk (1979).

Using the method outlined by Kobayashi et al. (1964), 34 of 101 broad whitefish tagged, fin clipped and released at Aklavik in 1992, and 151

of 1223 broad whitefish and 9 of 169 inconnu tagged, fin clipped and released at Horseshoe Bend in 1993 were also injected intraperitoneally (i.e., into the body cavity) with oxytetracycline (OTC) at a dosage of 35 mg kg^{-1} body weight (see Fig. 2). This dosage was within the recommended ranges given by McFarlane and Beamish (1987) and Babaluk and Craig (1990). Any whole carcasses of OTC-marked broad whitefish and inconnu recovered from the subsistence fishery over the next several years had the otoliths and pelvic fins removed and prepared for ageing as described by Campbell and Babaluk (1979). Otolith and pelvic fin ray sections were examined under transmitted white light with a compound microscope and reflected ultraviolet light with a fluorescence compound microscope. Photographs were taken on Kodak TRI-X PAN film (400 ASA) with a 35-mm camera attachment.

TAG RECOVERY PROCEDURE

As part of the recapture-recovery procedure, "reward" posters were widely distributed after the initial tagging project at Aklavik in 1992 and again after the Horseshoe Bend tagging project in 1993 (see Fig. 3). Posters were sent to all ISR Hunters and Trappers committees and area Gwich'in Renewable Resource councils (GRRRC) for posting on office bulletin boards. Posters were also distributed to area post offices and retail stores. A reward of \$5.00 was offered to fishermen for each tag returned with information on the date and location of recovery. A reward of \$20.00 was offered for the return of whole, tagged fish to assess age determination methods.

In 1995, with additional funding from FJMC, a more concerted tag recovery effort was undertaken. In addition to a re-distribution of posters to all HTC and GRRRC offices and retail stores in the ISR, copies of the posters were published in the area weekly newspaper, *Tusaayaksat*. Advertisements were also broadcast on the Inuvik community events cable television channel and copies of the poster were delivered by Canada Post to all mail boxes in lower Mackenzie River communities.

DATA ANALYSIS

Length, weight and age data were analysed using SigmaStat (2.0) and/or Statistica (5.1)

personal computer software programs and figures were created using SigmaPlot (4.0) and CorelDraw (8.0).

Length-weight relationships were described by the equation:

$$\log_{10} W = a + b (\log_{10} L)$$

where: W = weight in grams

L = fork length in millimetres

a = Y axis intercept

b = slope of the regression line

Fulton's relative condition factor (K) was determined from the formula:

$$K = \frac{W \times 10^5}{L^3}$$

RESULTS AND DISCUSSION

SPECIES COMPOSITION

Ten fish species were identified from gill net catches during the tagging study. A list of fishes captured at Aklavik in 1992 and Horseshoe Bend in 1993 is presented in Table 1. Common and scientific names are from Robins et al. (1991). At total of 396 fish were enumerated, tagged and/or measured at Aklavik. The catch was dominated by broad whitefish (locally called whitefish) (45.5%) and northern pike (jack fish) (30.6%) with smaller numbers, in descending order, of lake whitefish (crooked-backs, humpbacks), inconnu (coney, conii), Dolly Varden, least cisco (herring), longnose sucker, burbot (loche) and pink salmon (Fig. 4A). The Horseshoe Bend catch was composed of 2886 fish. It was dominated by broad whitefish (46.2%) and lake whitefish (41.1%) with smaller numbers, in descending order, of inconnu, northern pike, Arctic cisco, burbot and longnose sucker (Fig. 4B). At both locations, broad whitefish was the most numerous species caught. Differences in the numbers of the other main species may have been the result of the gill net mesh size differences (4.5" at Aklavik; 5.5" at Horseshoe Bend) or differences in habitat (channels are generally smaller near Aklavik). Least cisco were caught only at Aklavik whereas Arctic cisco were caught only at Horseshoe Bend. As both species are common in the Mackenzie River Delta (Stein et al. 1973a), the

lack of one or the other in the respective catches may have been due to differences in the timing of spawning migrations and/or gill net selectivity. Mature anadromous Arctic cisco begin upstream movements through the Mackenzie River Delta in early summer whereas upstream spawning migrations of anadromous least cisco begin in the Mackenzie River Delta in late summer and early fall (Stein et al. 1973a). The sampling period at Horseshoe Bend (July 20 - August 21, 1993) may have corresponded with Arctic cisco movements whereas the sampling period at Aklavik (August 25 - September 7, 1992) may have better corresponded with least cisco movements. Least cisco, with their generally smaller and more compressed bodies (Scott and Crossman 1973), would also be more prone to capture in the smaller mesh nets used at Aklavik than Arctic cisco.

Our catches were made up of the same species as the subsistence fisheries for the western Mackenzie River Delta and the eastern Mackenzie Delta as reported by Stewart (1996). Although Stein et al. (1973a) report catching of isolated char in the main channel of the Mackenzie River near Horseshoe Bend, the majority of char that they reported were caught from the west side of the Mackenzie Delta and lower Mackenzie River. Our study supports their findings as no char were caught at Horseshoe Bend in 1993 whereas 18 char were caught near Aklavik in 1992 (Fig. 4).

TAG RECOVERIES

Broad whitefish

A total of 101 broad whitefish were tagged and released at Aklavik in 1992 (Table 2; Appendix 1) and at Horseshoe Bend in 1993, 1223 broad whitefish were tagged and released (Table 2; Appendix 2). As of March 31, 2000, 36 or 2.7% of those tagged had been reported recaptured. Of those recaptures, 13 were tagged at Aklavik while 23 had been tagged at Horseshoe Bend (Table 2). The recovery rate from the Aklavik tagging operation was 12.9% while from the Horseshoe Bend tagging, the recovery rate was 1.9%.

Recapture locations of broad whitefish tagged at Aklavik are shown in Figure 5. Of the fish tagged at Aklavik in 1992, three were recaptured in the fall 1992: 1) tag no. A0009 in the Peel Channel just upstream of Aklavik; 2) tag

no. A0011 in the Peel River upstream of Fort McPherson and 3) tag no. A0015 in the Arctic Red River near Tsiigehtchic. The latter two fish were probably migrating to known spawning areas in the Peel and Arctic Red rivers, respectively (Chang-Kue and Jessop 1983; Chang-Kue and Jessop 1997). In subsequent years, several other broad whitefish were reported recaptured near Aklavik or in the Peel River (Fig. 5). One specimen (tag no. A0151/2) was reported from the 1995 subsistence fishery at Shingle Point (Beaufort Sea coastal area). This summer feeding area is close to a known broad whitefish over-wintering area in Shallow Bay (Chang-Kue and Jessop 1997). The last reported recaptured broad whitefish that was tagged at Aklavik (tag no. A0027) was caught in October 1997 near a known spawning area in the Peel River.

Based on tag return data from this study (Fig. 5), there is evidence to suggest that broad whitefish, available to the subsistence fisheries of Aklavik and Fort McPherson, tend to migrate along the western side of the Mackenzie River Delta to their spawning areas. One fish (tag no. A0123/4), though, was recaptured in the East Channel, south of Inuvik, and another (tag no. A0015) was recaptured at Tsiigehtchic suggesting that there may be some straying (ca. 15%).

Recapture locations of broad whitefish tagged at Horseshoe Bend are shown in Figure 6. Of the fish tagged at Horseshoe Bend in 1993, 18 were reported as recaptured before local fishing operations ended for that year. Seven of the 18 recaptured fish were recaptured shortly after they were tagged in an experimental commercial fishery conducted in the Middle Channel in the vicinity of Horseshoe Bend during September, 1993 (Fig. 6; tag no. A0756, A0959, A1823/4, A1887, A2058, A2063 and A2134) and two others (tag no. A0808 and A1327) were recaptured in subsistence fisheries later in fall 1993 (but before the spawning period) near Aklavik and Inuvik, respectively. The information obtained from these tag returns concurred with an earlier radio-tagging study that suggested that some broad whitefish spend a part of the summer before spawning in the Mackenzie River Delta before moving quickly (near the end of October) to various upstream spawning areas (Chang-Kue and Jessop 1997). Six tagged broad whitefish were caught in the Arctic Red River or Mackenzie River near Tsiigehtchic and two were caught at the Ramparts Rapids

upstream of Fort Good Hope (Fig. 6). These fish appeared to be migrating to known spawning areas in the Arctic Red and Mackenzie rivers (Chang-Kue and Jessop 1997). The two fish reported at Ramparts Rapids were caught in August shortly after they were tagged. Previous tagging studies (Stein et al. 1973a; Chang-Kue and Jessop 1992) demonstrated that some migrating broad whitefish from the Mackenzie River Delta reached the Fort Good Hope area by mid-September.

Although the tag return data are limited, there appears to be a tendency for broad whitefish that spawn in the Arctic Red River and Mackenzie River between the Arctic Red River and Ramparts Rapids to migrate along the eastern side of the Mackenzie River Delta, especially the Middle Channel. One tagged broad whitefish (tag no. A0805) was caught in the subsistence fishery in Tuktoyaktuk harbour in 1994. However, similar to the broad whitefish tagged in the Aklavik area in 1992, there was evidence that suggested some straying of the fish tagged at Horseshoe Bend in 1993 (ca. 22%). Two of the fish tagged at Horseshoe Bend were eventually caught in the Peel River upstream of Fort McPherson (tag no. A0813 and A1830/1), most likely migrating to known spawning areas in the Peel River (Chang-Kue and Jessop 1997) and three were eventually caught in the Aklavik area (Fig. 6).

Inconnu

One hundred and sixty-nine inconnu were tagged and released at Horseshoe Bend in 1993 and as of March 31, 2000, 13 or 7.7% of those tagged had been reported recaptured (Table 2; Appendix 3).

Recapture locations of inconnu tagged at Horseshoe Bend are shown in Figure 7. The majority of the fish recaptured (9 of 13) were caught during fall 1993. Similar to the broad whitefish tagged and recaptured near Horseshoe Bend, four (4) were recaptured during the experimental commercial fishery conducted in the area shortly after they were tagged (Fig. 7; tag no. A0649, A1768, A1908 and A1915). One was recaptured near Aklavik in October 1993 and four were caught between August - October in the Arctic Red River upstream of, but near, Tsiigehtchic. Howland (1997) noted that during July and August greater numbers of pre-spawning inconnu were caught near the mouth

of the Arctic Red River and suggested that these fish represented the upstream spawning fish for that year. Howland (1997) also suggested that inconnu spawned in late September in the Arctic Red River, 5 - 10 km downstream of where the Cranswick River enters it. The inconnu (tag no. A1626/7) caught on August 15 was presumably a pre-spawning fish preparing to migrate upstream to spawn while the other three fish (tag no. A0669, A0753 and A1356) that were caught in October were most likely post-spawners returning from the spawning area in the upper Arctic Red River. A tagged inconnu (tag no. A1693) was caught at Horseshoe Bend in April 1994 suggesting that it may have over-wintered in the Horseshoe Bend area. Similar to the broad whitefish that spawn in the Arctic Red and Mackenzie rivers there is a tendency for inconnu to migrate through the middle to eastern regions of the Mackenzie River Delta (Fig. 7). Howland (1997) in compiling tag return data from previous studies noted similar migratory behaviour.

Dolly Varden

Twelve Dolly Varden were tagged and released at Aklavik in 1992 and as of March 31, 2000, only 1 of these tagged fish had been reported recaptured (Table 2; Appendix 4). This fish (tag no. A0061) was recaptured on August 6, 1995 in the Husky Channel of the Mackenzie River (Fig. 8). It was most likely returning to either the Rat or Vittekwa rivers to over-winter or spawn and over-winter after spending the summer feeding in the Beaufort Sea.

BIOLOGICAL EVALUATION

Broad whitefish

The length frequency distributions for broad whitefish (combined sexes) caught at Aklavik in 1992 and Horseshoe Bend in 1993 are shown in Figure 9. Broad whitefish captured at Aklavik ranged in fork length from 370 to 568 mm (Fig. 9A). This catch was uni-modal with the largest group of fish in the 481 - 490 mm range. Mean length of Aklavik broad whitefish was 471 mm. Broad whitefish captured at Horseshoe Bend ranged in length from 405 to 643 mm (Fig. 9B). This length frequency distribution was also uni-modal with the largest group of fish in the 491 - 500 mm range. Mean length of Horseshoe Bend fish was 501 mm. The generally smaller fish captured at Aklavik can most likely be attributed

to the smaller-mesh gill nets used there (114 mm stretched-measure at Aklavik; 140 mm at Horseshoe Bend). Broad whitefish caught with 140 mm gill nets in the 1993 Gwich'in commercial fishery in the Peel Channel (just south of Aklavik) had a mean length of 489 mm and ranged in length from 412 to 656 mm (M. Treble, unpubl. data). Using similar 140 mm gill nets, broad whitefish caught in the Uummarmiut Development Corporation (UDC) exploratory fishery at Horseshoe Bend in fall, 1993 had a mean fork length of 498 mm, a size range of 377 - 645 mm, and a mode of 475 mm (Treble and Tallman 1997). The sizes of broad whitefish caught in our study were similar to those caught in similar nets in the early 1970's (Stein et al. 1973b). They reported that the majority of their broad whitefish catch was between 431 and 510 mm. The broad whitefish at both Aklavik and Horseshoe Bend appear to be larger than those captured along the coast of the Tuktoyaktuk Peninsula as reported by Bond (1982).

Age frequency distributions for broad whitefish caught at Aklavik in 1992 and Horseshoe Bend in 1993 are shown in Figure 10. Broad whitefish caught at Aklavik ranged in age from 4 to 24 years (mean age = 10.6 years) while those caught at Horseshoe Bend ranged from 5 to 27 years (mean age = 12.6 years). The younger (i.e., smaller) fish caught at Aklavik were, again, most likely due to the smaller-mesh gill nets used there. Broad whitefish caught during the 1993 Gwich'in commercial fishery in the Peel Channel (just south of Aklavik) ranged in age from 5 to 23 years (mean age = 9.7 years) (M. Treble, unpubl. data). Treble and Tallman (1997), using the same ageing method (pelvic fin ray sections) used in our study, reported that broad whitefish caught in the UDC exploratory fishery at Horseshoe Bend in 1993 had an age range of 5 - 22 years (mean age = 11.5 years). Stein et al. (1973b), using scales to determine ages, reported a maximum age of 15 years for Aklavik area broad whitefish. Percy (1975), also using scales to determine ages, reported maximum ages of 15 years for Mackenzie River broad whitefish while de Graaf and Machniak (1977), using whole otoliths to determine ages, reported a maximum of 19 years for Mackenzie River broad whitefish. However, it should be noted that scales and whole otoliths have a tendency to underestimate ages of mature (i.e., old fish) (e.g., Campbell and Babaluk 1979; Barber and McFarlane 1987).

The relationships between fork length and

age (i.e., growth rate) for Aklavik and Horseshoe Bend area broad whitefish, based on the catch from this study, are shown in Figure 11. There appear to be no differences in growth rates between the fish in the two areas. These fish appear to grow rapidly for the first 5 - 6 years after which growth slows. Growth rates in the earlier years of the fishes' lives were similar to those for several Mackenzie River broad whitefish samples as summarised by Treble (1996). As scales were used to estimate ages (and, therefore, growth) in earlier studies of lower Mackenzie River broad whitefish (e.g., Stein et al. 1973b), no comparisons were made with our data. Since scales tend to underestimate ages of mature fish (Beamish and McFarlane 1983) growth rates in the earlier studies may have been overestimated.

The relationship between fork length (L) and body weight (W) for broad whitefish (males and females combined) from the Aklavik area is graphically presented in Figure 12A and is described by the equation:

$$\text{Log}_{10} W = -5.474 + 3.249 (\log_{10} L)$$

$$(r^2 = 0.894, n = 162)$$

Mean relative condition factor (K) for Aklavik broad whitefish was 1.560 (n = 162).

The relationship between fork length (L) and body weight (W) for broad whitefish (males and females combined) from the Horseshoe Bend area is graphically presented in Figure 12B and is described by the equation:

$$\text{Log}_{10} W = -4.464 + 2.878 (\log_{10} L)$$

$$(r^2 = 0.792, n = 685)$$

Mean relative condition factor (K) for Horseshoe Bend broad whitefish was 1.622 (n = 685).

As different gear (mesh size) was used at Aklavik and Horseshoe Bend no statistical comparison of the length-weight relationships was made. For comparison, the relationship between fork length and body weight for broad whitefish males (a) and females (b) from the Tuktoyaktuk area (Bond 1982) was described by the equations:

$$\text{a) } \text{Log}_{10} W = -5.701 + 3.325 (\log_{10} L)$$

$$b) \text{Log}_{10} W = -5.626 + 3.297 (\text{log}_{10} L)$$

Inconnu

The length frequency distribution for inconnu (combined sexes) caught at Horseshoe Bend in 1993 is shown in Figure 13. Inconnu captured at Horseshoe Bend ranged in fork length from 438 to 938 mm. The length frequency distribution was basically uni-modal with the largest group of fish in the 700 - 730 mm range. Mean length of Horseshoe Bend inconnu was 721 mm. As only a small number of inconnu were caught at Aklavik in 1992 (see Figure 4A), a length frequency distribution is not presented. Stein et al. (1973b) reported that the modal group in their inconnu catch at Aklavik and Arctic Red River was between 690 and 750 mm in fork length. Using slightly smaller-meshed gill nets than those used in our study at Horseshoe Bend, Bond (1982) reported a range of ca. 350 to 933 mm for inconnu from Tuktoyaktuk Harbour with the majority of the fish (ca. 70%) between 450 and 599 mm. Inconnu caught in the subsistence fishery along the Yukon River, Alaska ranged in length from ca. 610 to 1030 mm (Brown 2000). Mean length of the Yukon River inconnu was 754 mm and the modal group was between 720 and 760 mm.

The age frequency distribution for inconnu caught at Horseshoe Bend in 1993 is shown in Figure 14. The inconnu ranged in age from 5 to 31 years (mean age = 13.0 years). The modal group was 15 years old. Maximum age for these fish was greater than those reported for other lower Mackenzie River inconnu (e.g., Stein et al. (1973b), using scales, reported maximum ages of 22 and 18 years from Aklavik and Arctic Red River, respectively). Using scales to determine Yukon River inconnu ages, Alt (1973) gave a maximum age of 15 years while using otoliths Brown (2000) reported a maximum Yukon River inconnu age of 28 years (range = 7 - 28 years; mean = 11.3 years; mode = 10 years). Ages were not determined for inconnu caught at Aklavik in 1992.

The relationship between fork length and age for Horseshoe Bend area inconnu is shown in Figure 15. The fish grow rapidly for the first 5 - 6 years; after which their growth in length slows and then "flattens" or reaches its asymptote at ca. 20 years old.

The relationship between fork length (L) and

body weight (W) for inconnu (males and females) from the Aklavik area is graphically presented in Figure 16A and is described by the equation:

$$\text{Log}_{10} W = -5.675 + 3.238 (\text{log}_{10} L)$$

$$(r^2 = 0.977, n = 15)$$

Mean relative condition factor (K) for Aklavik inconnu was 0.952 (n = 15).

The relationship between fork length (L) and body weight (W) for inconnu (males and females) from the Horseshoe Bend area is graphically presented in Figure 16B and is described by the equation:

$$\text{Log}_{10} W = -5.376 + 3.134 (\text{log}_{10} L)$$

$$(r^2 = 0.961, n = 106)$$

Mean relative condition factor (K) for Horseshoe Bend inconnu was 1.016 (n = 106).

As different gear (mesh size) was used at Aklavik and Horseshoe Bend no statistical comparison of the length-weight relationships was made. For comparison, the relationship between fork length and body weight for inconnu males (a) and females (b) from the Tuktoyaktuk area (Bond 1982) was described by the equations:

$$a) \text{Log}_{10} W = -5.180 + 3.053 (\text{log}_{10} L)$$

$$b) \text{Log}_{10} W = -5.689 + 3.243 (\text{log}_{10} L)$$

Lake whitefish

The length frequency distributions for lake whitefish (combined sexes) caught at Aklavik in 1992 and Horseshoe Bend in 1993 are shown in Figure 17. Lake whitefish captured at Aklavik ranged in fork length from 341 to 519 mm. This catch was uni-modal with the largest group of fish in the 420 - 460 mm range. Mean length of Aklavik lake whitefish was 427 mm. Lake whitefish captured at Horseshoe Bend ranged in length from 422 to 530 mm. This length frequency distribution was also uni-modal with the largest group of fish in the 460 - 500 mm range. Mean length of Horseshoe Bend lake whitefish was 471 mm. The generally smaller fish captured at Aklavik can most likely be attributed to the smaller-mesh gill nets used

there. The sizes of lake whitefish caught in our study were similar to those caught in similar nets in the early 1970's (Stein et al. 1973b). They reported that the majority of their lake whitefish catch was between 350 and 550 mm. The lake whitefish at both Aklavik and Horseshoe Bend also appear to be similar in size to those captured along the coast of the Tuktoyaktuk Peninsula (Bond 1982).

The age frequency distribution for lake whitefish caught at Horseshoe Bend in 1993 is shown in Figure 18. The lake whitefish ranged in age from 8 to 30 years (mean age = 18.1 years). As with other fish species of the lower Mackenzie River, maximum age for these fish was greater than those reported by other workers (e.g., Stein et al. (1973b) using scales reported maximum age 16 years). Ages were not determined for lake whitefish caught at Aklavik in 1992.

The relationship between fork length and age for Horseshoe Bend area lake whitefish is shown in Figure 19. Although no fish younger than 8 years was captured, it appears that the fish grow to ca. 400 mm by age 7 years after which growth slows dramatically.

The relationship between fork length (L) and body weight (W) for lake whitefish (males and females) from the Aklavik area is graphically presented in Figure 20A and is described by the equation:

$$\text{Log}_{10} W = -5.453 + 3.245 (\log_{10} L)$$

$$(r^2 = 0.911, n = 32)$$

Mean relative condition factor (K) for Aklavik lake whitefish was 1.556 (n = 32).

The relationship between fork length (L) and body weight (W) for lake whitefish (males and females) from the Horseshoe Bend area is graphically presented in Figure 20B and is described by the equation:

$$\text{Log}_{10} W = -4.316 + 2.811 (\log_{10} L)$$

$$(r^2 = 0.679, n = 58)$$

Mean relative condition factor (K) for Horseshoe Bend lake whitefish was 1.518 (n = 58).

As different gear (mesh size) was used at

Aklavik and Horseshoe Bend no statistical comparison of the length-weight relationships was made. For comparison, the relationship between fork length and body weight for lake whitefish males (a) and females (b) from the Tuktoyaktuk area (Bond 1982) was described by the equations:

$$\text{a) } \text{Log}_{10} W = -5.938 + 3.421 (\log_{10} L)$$

$$\text{b) } \text{Log}_{10} W = -5.950 + 3.428 (\log_{10} L)$$

Northern pike

The length frequency distributions for northern pike (combined sexes) caught at Aklavik in 1992 is shown in Figure 21. Pike captured at Aklavik ranged in fork length from 431 to 915 mm. Mean length of Aklavik pike was 625 mm. The catch appears to be bi-modal with a major modal group between 550-650 mm. A second group of fish is in the 700-760 mm group. Stein et al. (1973b) reported a uni-modal length frequency for Aklavik area pike with the largest group of fish between 571-600 mm. This group coincides with the first modal group of our 1992 catch.

The age frequency distribution for northern pike caught at Aklavik in 1992 is shown in Figure 22. Based on cleithra, the pike ranged in age from 4 to 20 years (mean age = 10.5 years). Two modal groups were present in the catch: ages 8+ and 12+ years. Stein et al. (1973b), using scales to age pike from their catches, reported a maximum age of 19 years for pike (mean age = 9.0 years, modal age = 8-9 years) from the Aklavik area.

The relationship between fork length and age for Aklavik area northern pike is shown in Figure 23.

The relationship between fork length (L) and body weight (W) for northern pike (males and females) from the Aklavik area is graphically presented in Figure 24 and is described by the equation:

$$\text{Log}_{10} W = -4.931 + 2.938 (\log_{10} L)$$

$$(r^2 = 0.932, n = 106)$$

Mean relative condition factor (K) for Aklavik northern pike was 0.791 (n = 106).

Dolly Varden

The relationship between fork length (L) and body weight (W) for Dolly Varden (males and females) from the Aklavik area is graphically presented in Figure 25 and is described by the equation:

$$\text{Log}_{10} W = -5.007 + 3.035 (\text{log}_{10} L)$$

$$(r^2 = 0.982, n = 16)$$

Mean relative condition factor (K) for Aklavik Dolly Varden was 1.216 ($n = 16$).

Ages were not determined for Dolly Varden caught at Aklavik in 1992.

AGE VALIDATION STUDIES

Broad whitefish

Few whole, tagged broad whitefish have been recovered from the lower Mackenzie River subsistence fisheries. As of March 31, 2000, the carcass of only one tagged, OTC-marked and fin clipped broad whitefish, at liberty for at least 1 year, had been recovered from the lower Mackenzie River subsistence fishery (see Table 2). This fish (tag no. A0130/3, see Fig. 5 and Appendix 1) was initially captured, double-tagged, fin clipped, injected with OTC and released at Aklavik on September 5, 1992 and was recaptured near Aklavik in September, 1995 after being at large for 3 years. A second tagged, OTC-marked and fin clipped broad whitefish (tag no. A1813/4, see Fig. 7 and Appendix 2) that was captured, double-tagged, fin clipped, injected with OTC and released at Horseshoe Bend on August 8, 1993, was recaptured also. However, it was recovered after only 3 months at large (November 15, 1993) in the Arctic Red River near Tsiigehtchic. Also, a tagged and fin clipped only, whole broad whitefish, at liberty for at least 1 year, has been recovered from the lower Mackenzie River subsistence fishery (Table 2). This fish (tag no. A0027, Fig. 5 and Appendix 1) was captured, tagged, fin clipped and released at Aklavik on August 30, 1992 and was recaptured at the confluence of the Trail River (66°40' N, 134°40' W) and the Peel River in Yukon Territory on October 20, 1997 after being at large for 5 years. A summary of age validation and biological information for these three broad whitefish is presented in Table 3.

While the tagging project was being

conducted in 1992, an experiment was conducted to assess the timing of OTC uptake by calcified structures in the fish (i.e., in otoliths and pelvic fin rays). Two broad whitefish that had been injected with OTC were held and sacrificed after 12 and 24 hours, respectively. The otoliths and pelvic fin rays from both specimens, when examined with ultraviolet light, fluoresced in numerous locations at the otolith and fin ray edges. In addition, the otolith and fin rays from the broad whitefish at large for only three months (tag no. A1813/4, Table 3) had a thin, yellow-green fluorescing band of OTC that was visible completely around the perimeter of the otolith and fin rays. The OTC depositions were similar to those described by Babaluk and Craig (1990). As well, ultraviolet light scans of otoliths and pelvic fin ray sections from recaptured fish that had not been injected with OTC showed no evidence of natural fluorescence. It was concluded that OTC was an accurate time marker on otoliths and pelvic fin rays in broad whitefish.

Examination with ultraviolet light of otolith and pelvic fin sections from the OTC-marked broad whitefish that had been at large for three years (tag no. A0130/3) revealed a band of OTC-induced fluorescence on these structures (Fig. 26A and 27A). Each structure had three completed annuli after the OTC mark (Fig. 26 and 27, respectively; Table 3) which had been expected since this fish was injected with OTC in September, 1992 and was recaptured in September, 1995.

Two tagged and fin clipped broad whitefish (including the one, described above, that was also injected with OTC), at liberty for at least 1 year, were recovered whole from the subsistence fishery (Table 2 and 3): one fish (tag no. A0130/3, Fig. 5 and Appendix 1) was at large for 3 years while the other fish (tag no. A0027, Fig. 5 and Appendix 1) was at large for 5 years.

Examination of the pelvic fin rays collected at the time of tagging and at the time of recapture for these two fish showed that, in both cases, an annulus was laid down on the pelvic fin rays for each year the fish were at liberty (Table 3). The broad whitefish (tag no. A0130/3), aged as 11+ years old in 1992, was aged at 14+ years when it was recaptured in 1995 (Fig. 28; Table 3). Similarly, the fish (tag no. A0027), aged as 7+ years in 1992, was aged at 12+ years when it was recaptured in 1997 (Table 3).

Inconnu

Only one tagged, fin clipped, whole inconnu, at liberty for at least 1 year, was recovered from the subsistence fishery (Table 2 and 3). This fish (tag no. A1841, see Fig. 8 and Appendix 3) was captured, tagged, fin clipped and released at Horseshoe Bend on August 9, 1993 and was recaptured in the same area on July 18, 1996 after being at liberty for 3 years. Examination of the pelvic fin rays collected at the time of tagging and at the time of recapture of this fish showed that, similar to the broad whitefish, an annulus is laid down on the pelvic fin rays for each year the fish was at large. This inconnu, aged as 6+ years in 1993, was aged at 9+ years when it was recaptured in 1996 (Fig. 29; Table 3).

Beamish and McFarlane (1983) defined "validation" as "proving a technique is accurate". Although we only had a small number of recoveries, there was evidence to suggest that ages determined from broad whitefish otoliths and pelvic fin rays and inconnu pelvic fin rays are accurate.

ACKNOWLEDGMENTS

The tagging project was funded by the Inuvialuit Fisheries Joint Management Committee. The authors would like to thank P. Bernhardt, the late N. Capot-blanc, F. Day, L. Day, D. Joe, P. Kasook, F. Rogers and R. Tardiff for help with tagging and data collection. Although it is not a complete list, we thank the following for returning tags or tagged fish: N. Andre, J. Blake, J. Cardinal, J. Carmichael, D. Chudobiak, W. Cockney, B. Day, E. Dillon, R. Elias, T. Emanuel Jr., J. Gerome, P. Harrison, A. Koe, J. Koe, G. Kogiak, S. Lennie, B. McLeod, E. McLeod, M. McLeod, A. Neyando, G. Niditchie, V. Pokiak, J. Robert, L. Ross, J. Snowshoe and L. Snowshoe. L. Heuring determined northern pike ages. The Aurora Research Institute: Inuvik Research Centre (formerly the Science Institute of the Northwest Territories) and Fisheries and Oceans Canada: Inuvik Area Office provided logistical support. The Aklavik and Inuvik Hunters' and Trappers' committees provided support and advice. We also thank J. Amos, B. Day and B. Erigaktuk for their advice and hospitality. We thank J. Reist and S. Stephenson for providing constructive comments on an

earlier version of the manuscript and D. Laroque for assistance with preparing the manuscript for publication.

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Table 1. Names (from Robins et al. 1991) and numbers of fish captured at Aklavik in 1992 and Horseshoe Bend in 1993 during the tagging study.

Common name	Scientific name	Aklavik (1992)	Horseshoe Bend (1993)
broad whitefish	<i>Coregonus nasus</i>	180	1333
lake whitefish	<i>Coregonus clupeaformis</i>	41	1187
inconnu	<i>Stenodus leucichthys</i>	21	249
northern pike	<i>Esox lucius</i>	121	84
Dolly Varden	<i>Salvelinus malma</i>	18	-
Arctic cisco	<i>Coregonus autumnalis</i>	-	31
least cisco	<i>Coregonus sardinella</i>	10	-
burbot	<i>Lota lota</i>	1	1
longnose sucker	<i>Catostomus catostomus</i>	3	1
pink salmon	<i>Oncorhynchus gorbuscha</i>	1	-
Total		396	2886

Table 2. Summary of fish tagged (1992-1993) and recaptured (to March 31, 2000) in the lower Mackenzie River.

Year	Tagging location	Species	Number of fish tagged			Number of fish recaptured				Total
			Tag, fin clip	Tag, fin clip, OTC	Total	Fin clip, tag only	Fin clip, tag, whole fish	Fin clip, OTC, tag only	Fin clip, OTC, tag, whole fish	
1992	Aklavik	BWF ¹	67	34	101	6	1	5	1	13
		DV ²	12	-	12	1	-	-	-	1
1993	Horseshoe Bend	BWF	1072	151	1223	19	-	3	1	23
		INC ³	160	9	169	11	1	1	-	13

¹broad whitefish; ²Dolly Varden; ³inconnu.

Table 3. Summary of age validation and morphometric information for recaptured broad whitefish and inconnu from the lower Mackenzie River area.

Species - tag no.	Date captured	OTC	Fin clip	Date recaptured	Age at capture (yr)	Time elapsed (yr)	No. of increments since mark/fin clip	Age at recapture (yr)	Fork length (mm)		Weight (g)		Sex	Maturity at recapture
									At capture	At recapture	At capture	At recapture		
BWF ¹ - A0130/3	5 Sept. 1992	Yes	Yes	Sept. 1995	11+	3	3	14+	488	494	1800	1780	F	Ripe
BWF - A1813/4	8 Aug. 1993	Yes	Yes	15 Nov. 1993	17+	<1	0	17+	495	496	1800	1665	M	Spent
BWF - A0027	30 Aug. 1992	No	Yes	20 Oct. 1997	7+	5	5	12+	457	551	1350	3100	M	Spent
INC ² - A1841	9 Aug. 1993	No	Yes	18 Jul. 1996	6+	3	3	9+	545	622	-	2500	M	Resting

¹broad whitefish; ²inconnu.

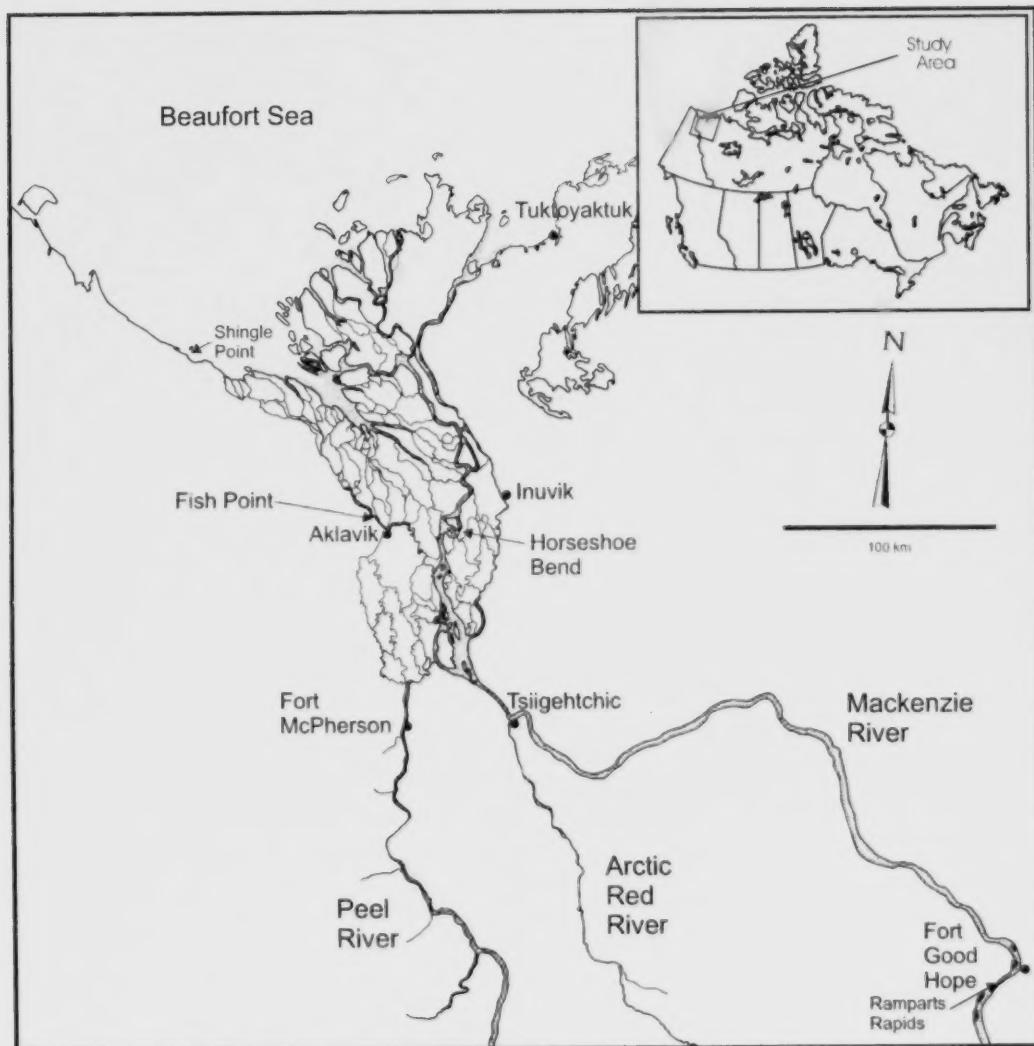


Fig. 1. Map of the lower Mackenzie River and Beaufort Sea coastal area showing the study area.

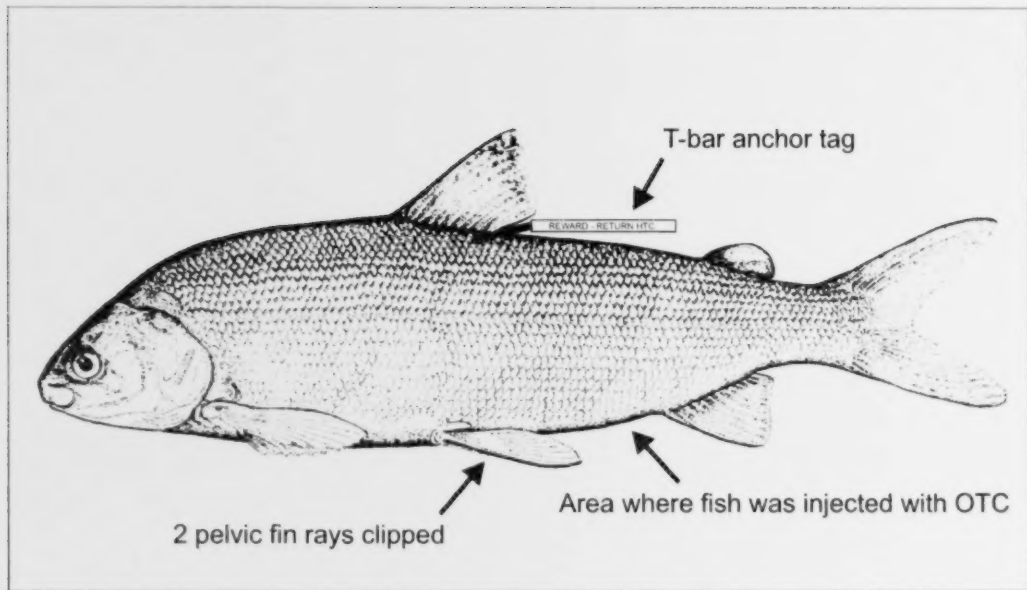
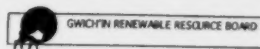


Fig. 2. Diagram of a broad whitefish showing a T-bar anchor tag, the pelvic fin rays that were clipped and where the fish was injected with oxytetracycline (OTC).



Reward

To obtain information on movement, distribution and stock size of the fishery resources of the lower Mackenzie River, the Department of Fisheries and Oceans, Gwich'in Renewable Resources Board and Fisheries Joint Management Committee will be applying coloured, plastic, T-bar anchor tags (as illustrated above) to Arctic char during 1995.

Also, during 1992 and 1993, DFO and FJMC tagged broad whitefish in the lower Mackenzie River with similar yellow tags. Many of these fish are still available for recapture.

If you catch a tagged fish and turn in the tag and the following catch information you will get a reward (\$5.00), or if you turn in the whole tagged fish (fresh frozen) and the catch information, the reward will be \$20.00.

Catch information from Tagged Fish (to get a reward):

- your name and address
- the EXACT LOCATION where you caught the fish
- the DATE when you caught it
- the tag

Whole frozen fish (to get a \$20 cash reward):

- all of the above catch information PLUS the whole fish (fresh frozen) with the tag still attached

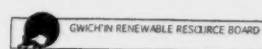
For tag and whole fish rewards, contact your local Hunters and Trappers Committee, your local Renewable Resources Council, or the Department of Fisheries and Oceans in Inuvik (979-3314), Box 1871, INUVIK, NT, X0E 0T0.



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Thanks for your participation!



Akilinniraasi

Iisimasukkutik aulayarak, sumitlaaguaniklu qanun inuqakilaanganiklu iqalungnik uumarmi Kuupanganlu, Angalatchiyit Iqalungnik Tarumiklu, fiqit Angalatchiyit Niryutugun Iqalutugunlu Katimaviat kapimariat Iqalukpit nalunaitkutamik qamuyamik, T-bar kisagun ittuat (qalaanittuatun ittuag) ukungami 1995 isagutituk.

Suliptag, 1992mi 1993mi, DFOkutlu FJMCkutlu nalunaitkutamat anaqut Uumarmi Kuupangan qusugtuamik Inuqakutut iqalut amatkutat pilagavut qangma.

Iqalugapi nalunaitkutaruqumik asin qallugu tama nalunaitkusiq uvaptingun akilinniripis (\$5.00), aulittuamik iqalungnik qatikupis nalunaitkutaruqumik (Qiqsaq Piqammiqtaq) qaharupikulu qanuu piyan, akilinniraasi \$20.00.

Nalunaitkutaruqut Iqalut pugumagit ukat (akilinniripis):

- Atqinlu inuqarvinlu
- NANITHLAANGANIK nunami iqalugavit
- UBLUNANIK iqalugavit
- nalunaitkutag

Qiqsat aulittuutlu iqalut (akilinniripis) \$20.00:

- qulanittuat maliyaksat asintag aulittuut (Qiqsaq Piqammiqtaq) nalunaitkutaruqutag sul

Nalunaitkutaruqumik kangisutukupis kulu, qusarlugit Angumagiti naniratuqumiklu Katimaviat, Niryutugun Angalatchiyat Katimaviat, ukat hoonin Angalatchiyit Iqalungnik Tarumiklu Inuvingmiituat (979-3314), Box 1871, INUVIK, NT X0E 0T0.



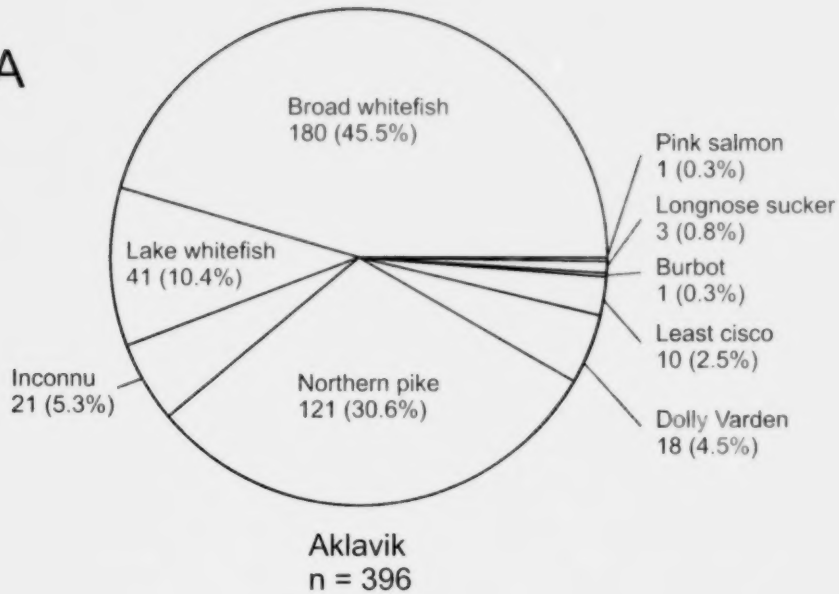
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et Océans

Quvanainni Ilaagapsi!

Fig. 3. Examples of posters used in effort to obtain information on tagged fish.

A



B

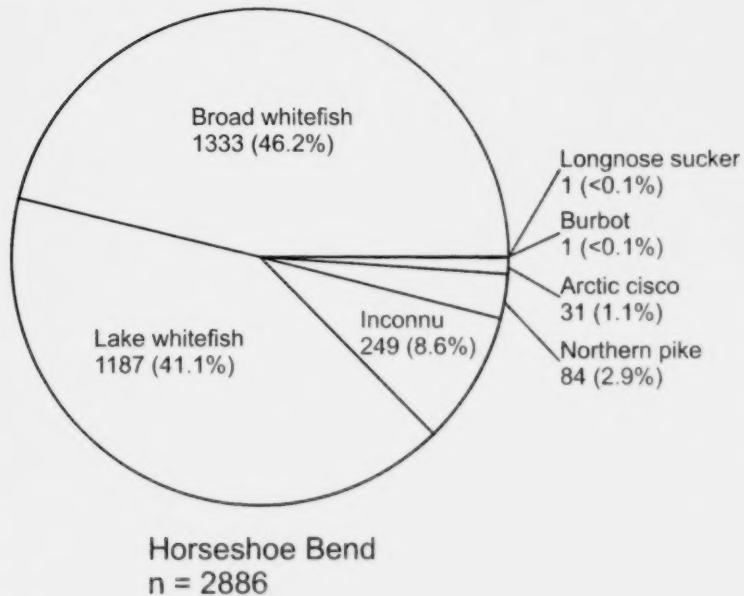


Fig. 4. Species composition of the gill net catch from the lower Mackenzie River, 1992 - 1993.

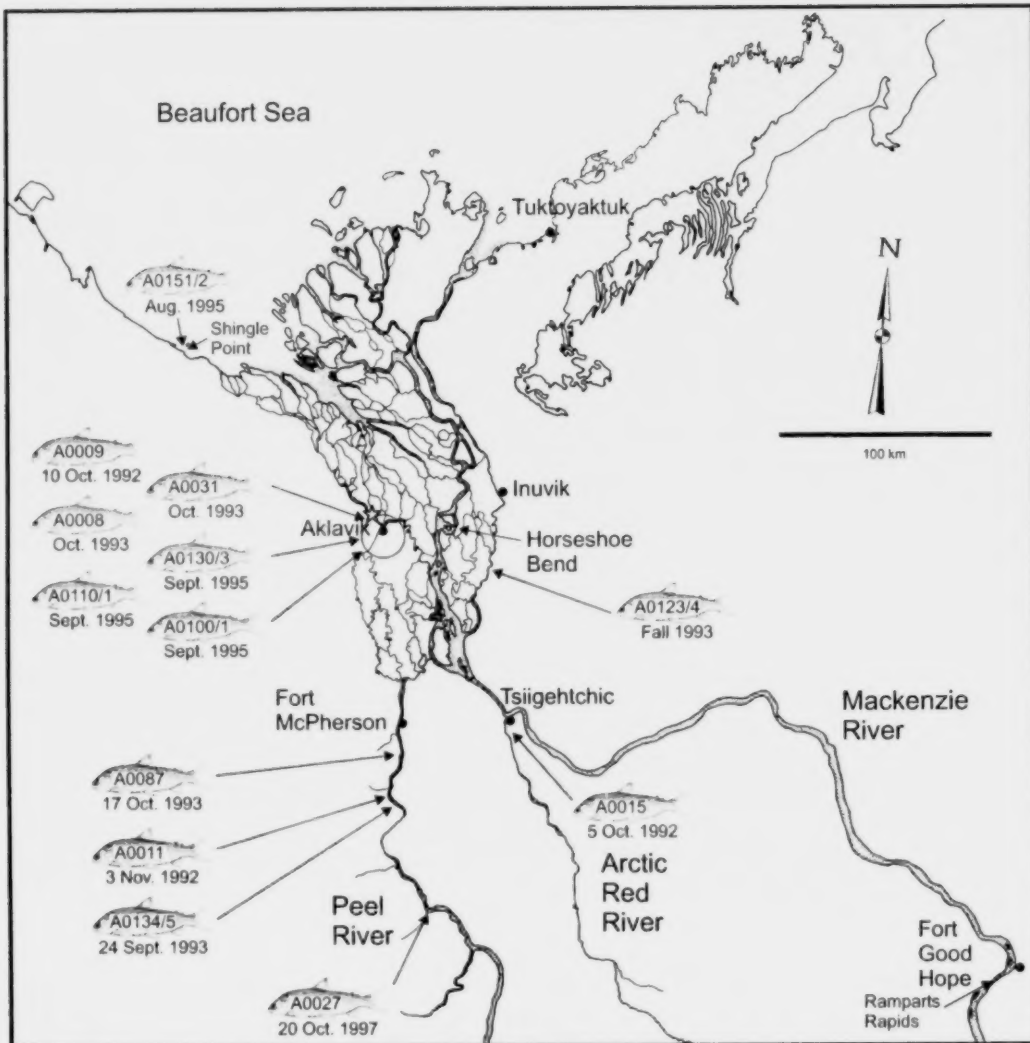


Fig. 5. Map of the lower Mackenzie River showing the 1992 tag and release location near Aklavik (open star) for broad whitefish ($n=101$) and approximate reported recapture location and date of tagged fish ($n=13$). Circle encompasses the general area from which Aklavik recaptures were reported.

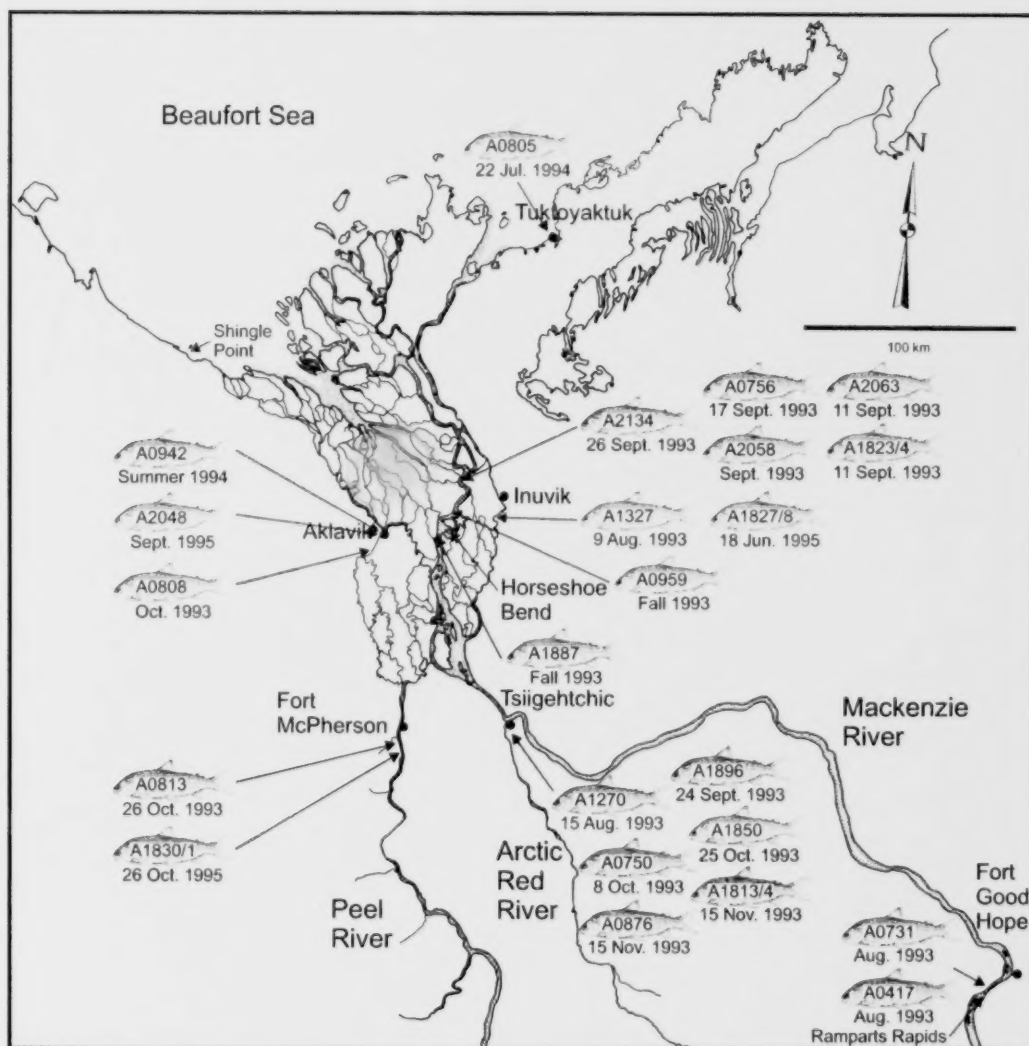


Fig. 6. Map of the lower Mackenzie River showing the 1993 tag and release location at Horseshoe Bend (open star) for broad whitefish ($n=1223$) and approximate reported recapture location and date of tagged fish ($n=23$).

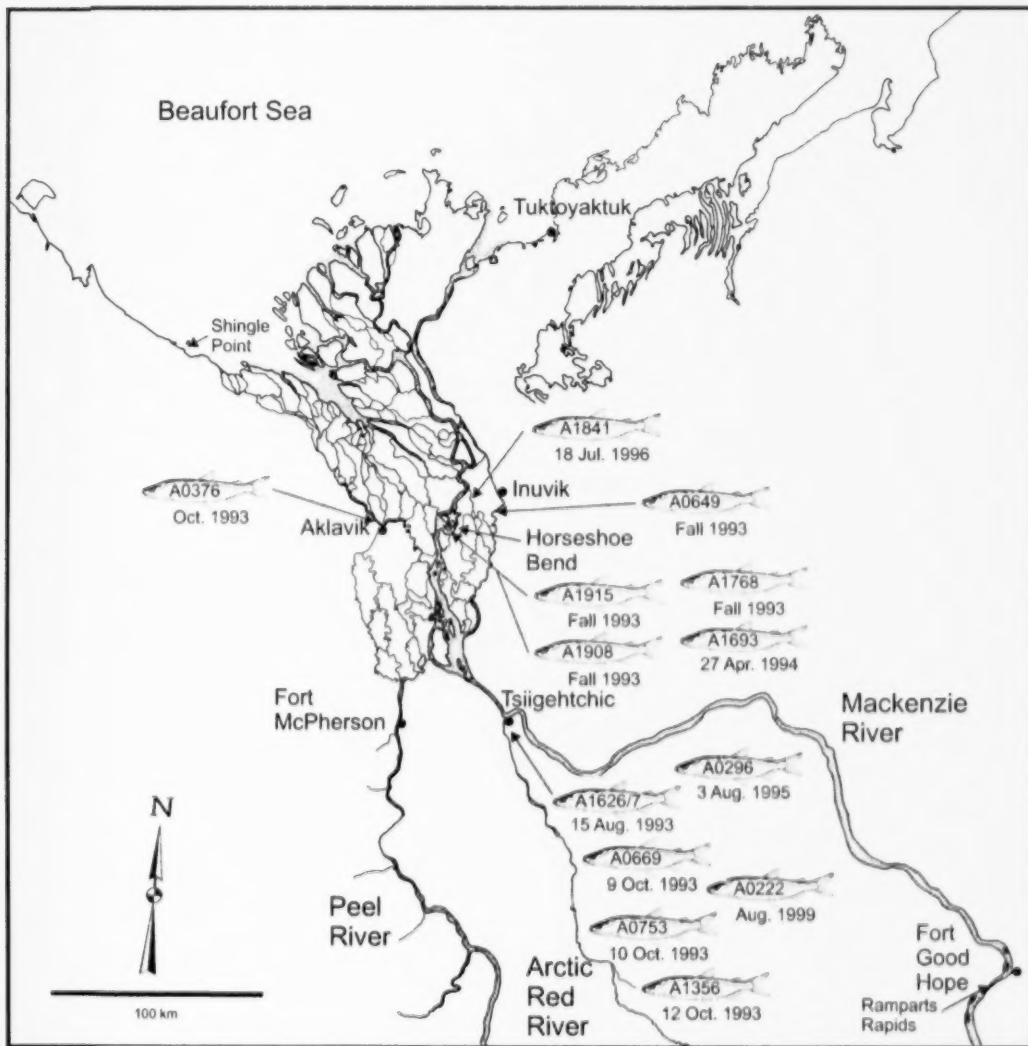


Fig. 7. Map of the lower Mackenzie River showing the 1993 tag and release location at Horseshoe Bend (open star) for inconnu ($n=169$) and approximate reported recapture location and date of tagged fish ($n=13$).

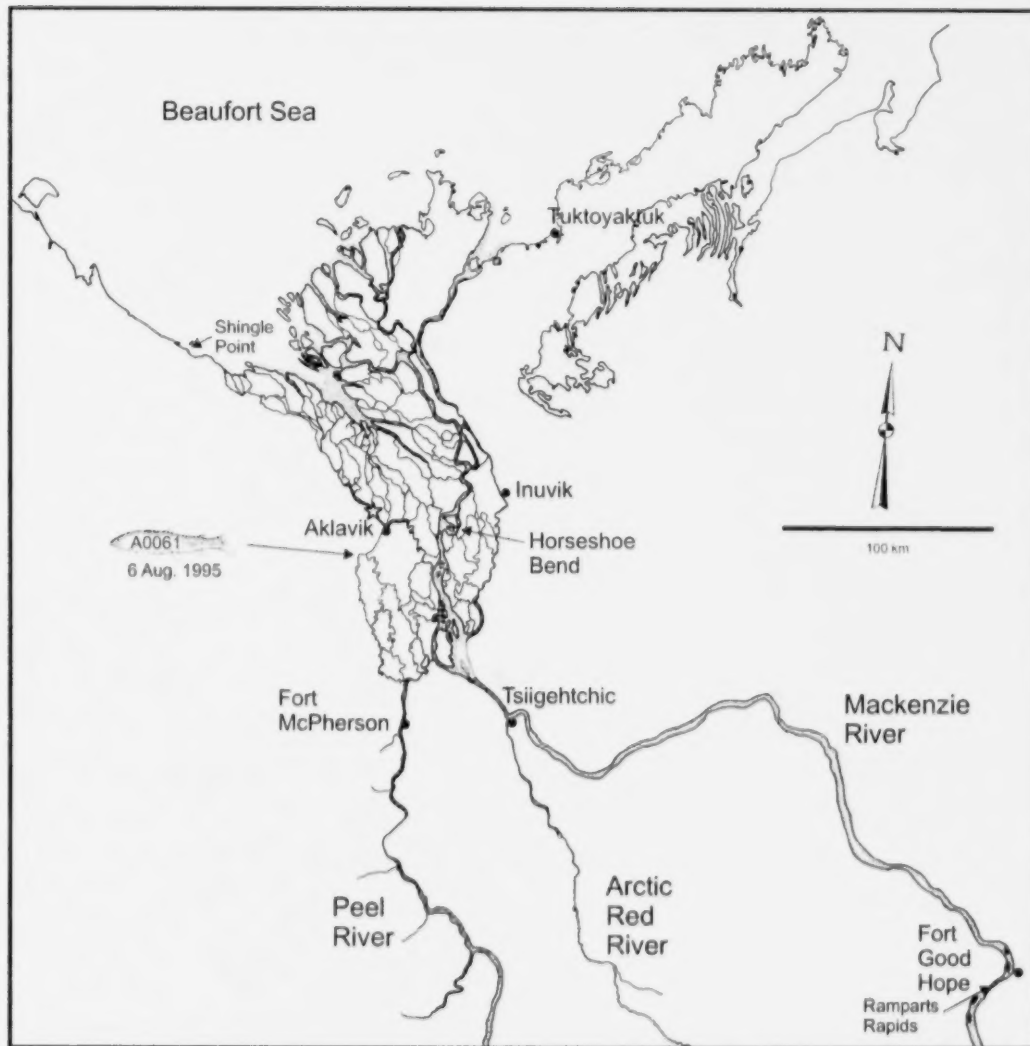


Fig. 8. Map of the lower Mackenzie River showing the 1992 tag and release location near Aklavik (open star) for Dolly Varden ($n=12$) and approximate reported recapture location and date of tagged fish ($n=1$).

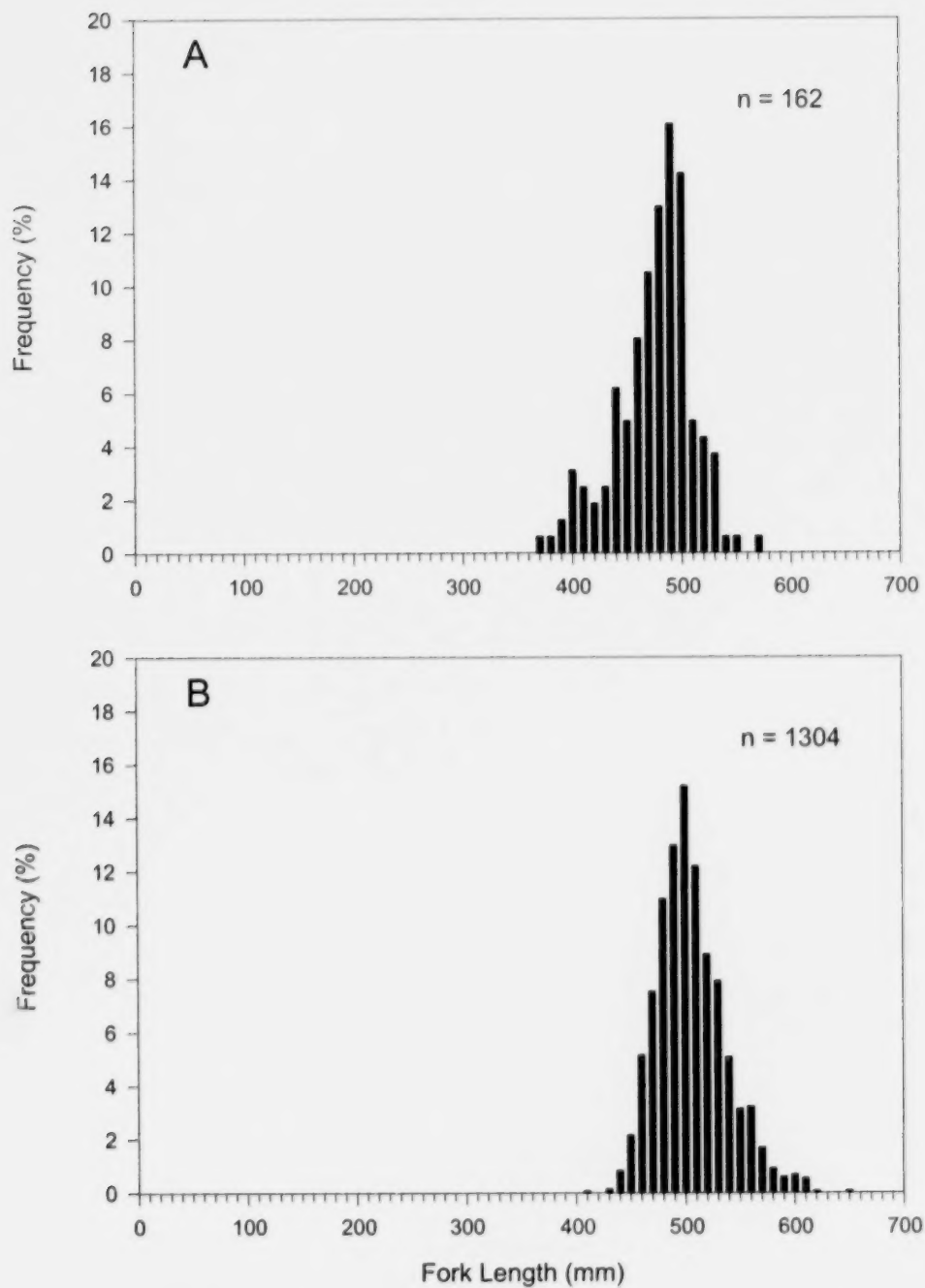


Fig. 9. Length frequency distributions for broad whitefish captured at (A) Aklavik in 1992 and (B) Horseshoe Bend in 1993.

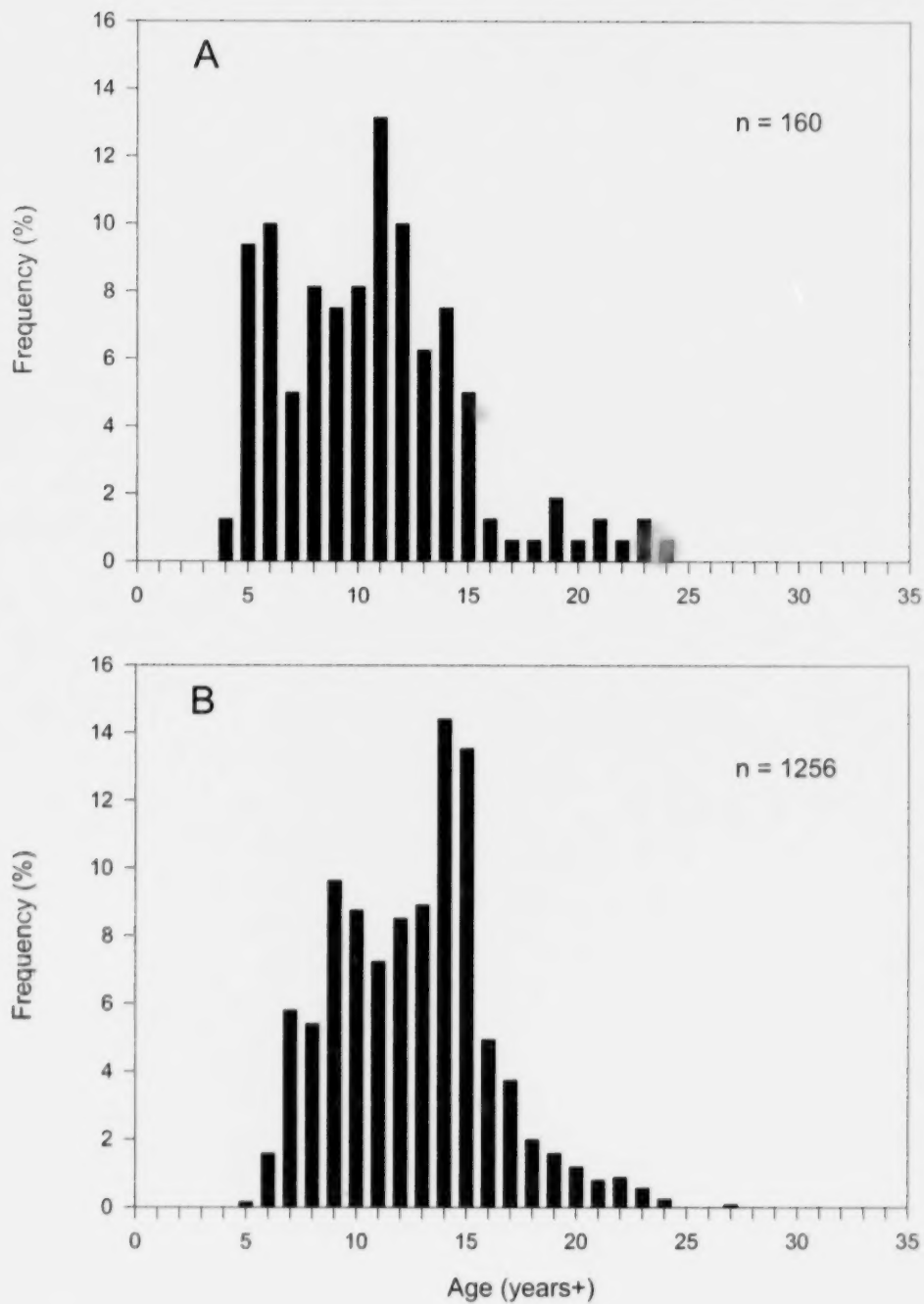


Fig. 10. Age frequency distributions for broad whitefish captured at (A) Aklavik in 1992 and (B) Horseshoe Bend in 1993.

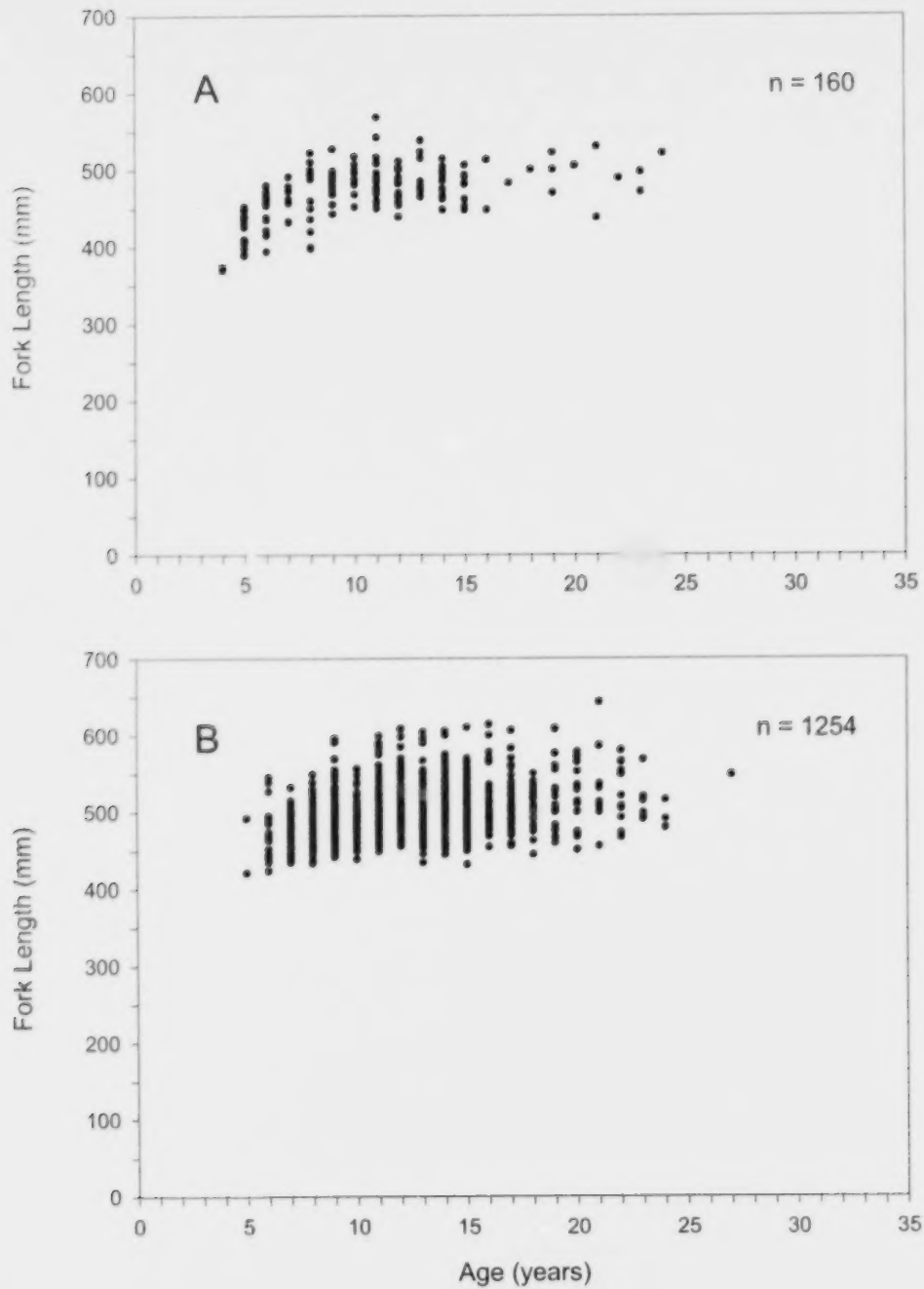


Fig. 11. Relationship between fork length and age for broad whitefish captured at (A) Aklavik in 1992 and (B) Horseshoe Bend in 1993.

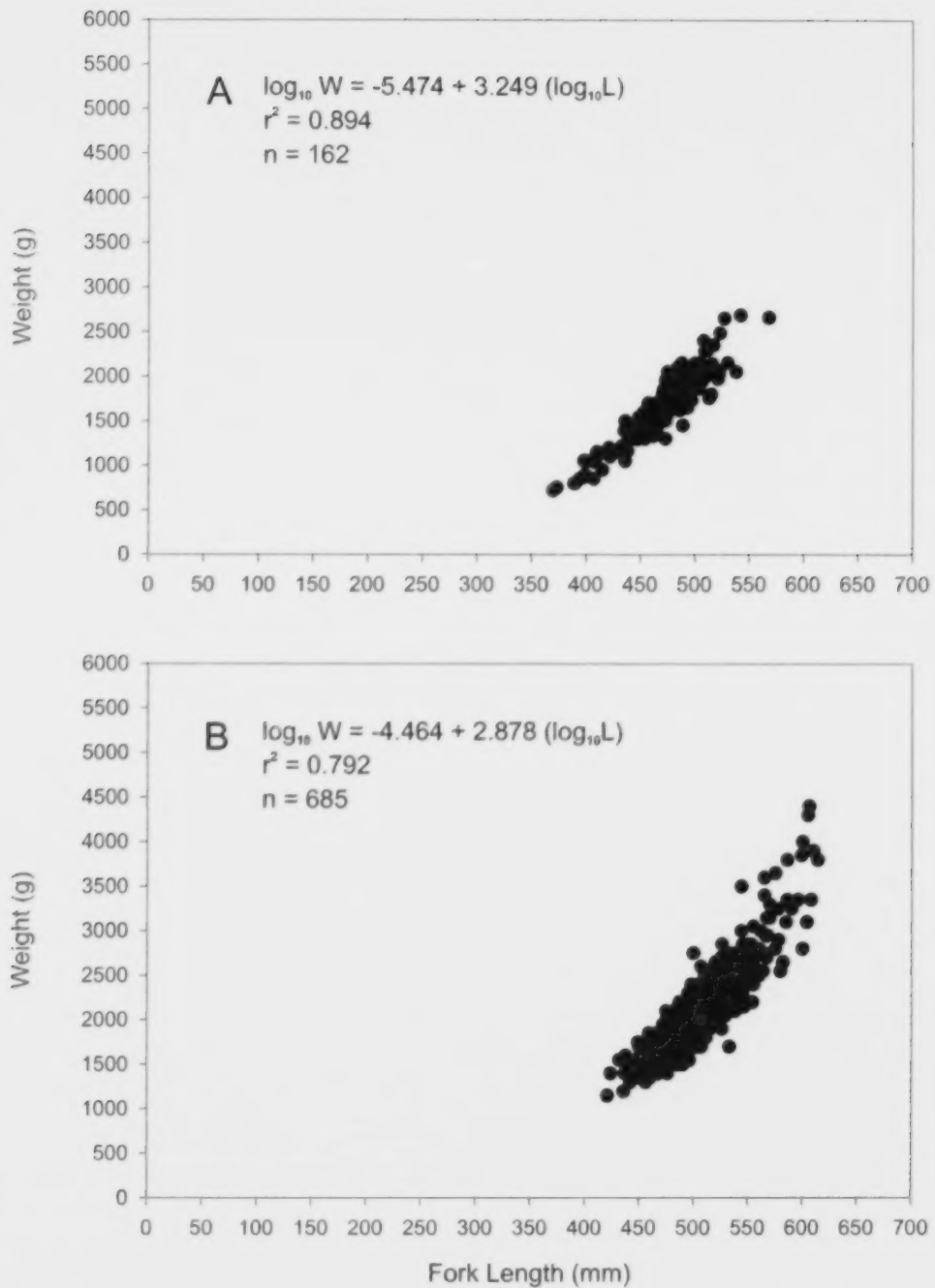


Fig. 12. Relationship between weight and fork length for broad whitefish captured at (A) Aklavik in 1992 and (B) Horseshoe Bend in 1993.

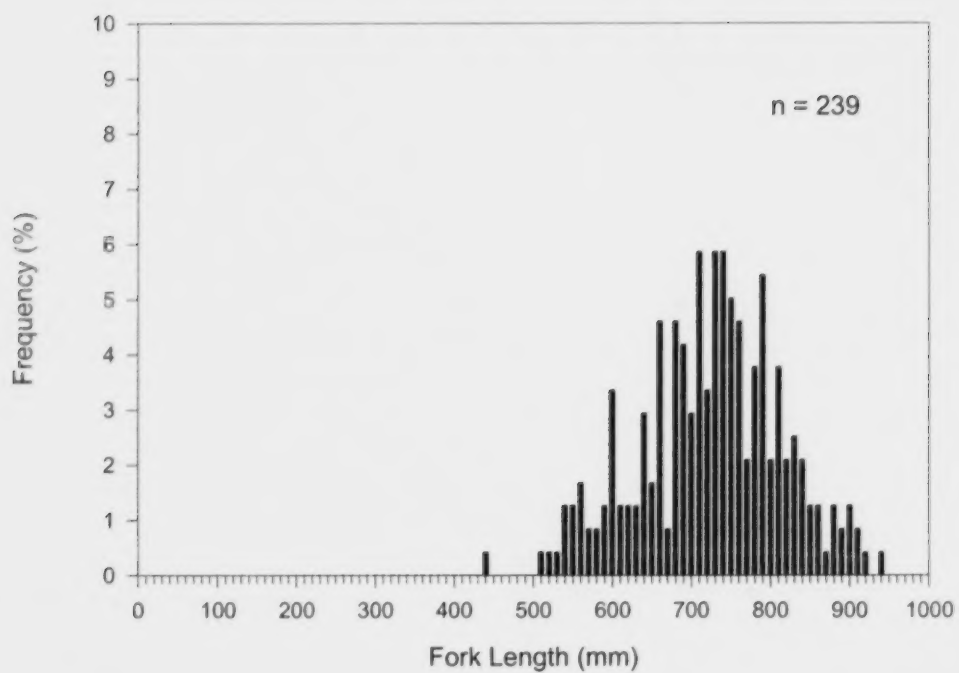


Fig. 13. Length frequency distribution for inconnu captured at Horseshoe Bend in 1993.

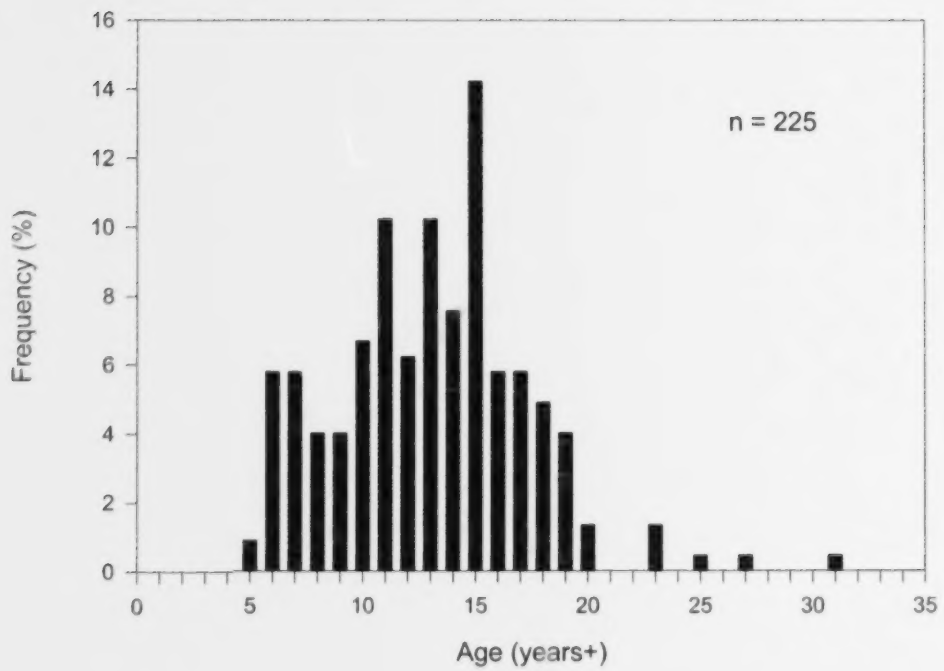
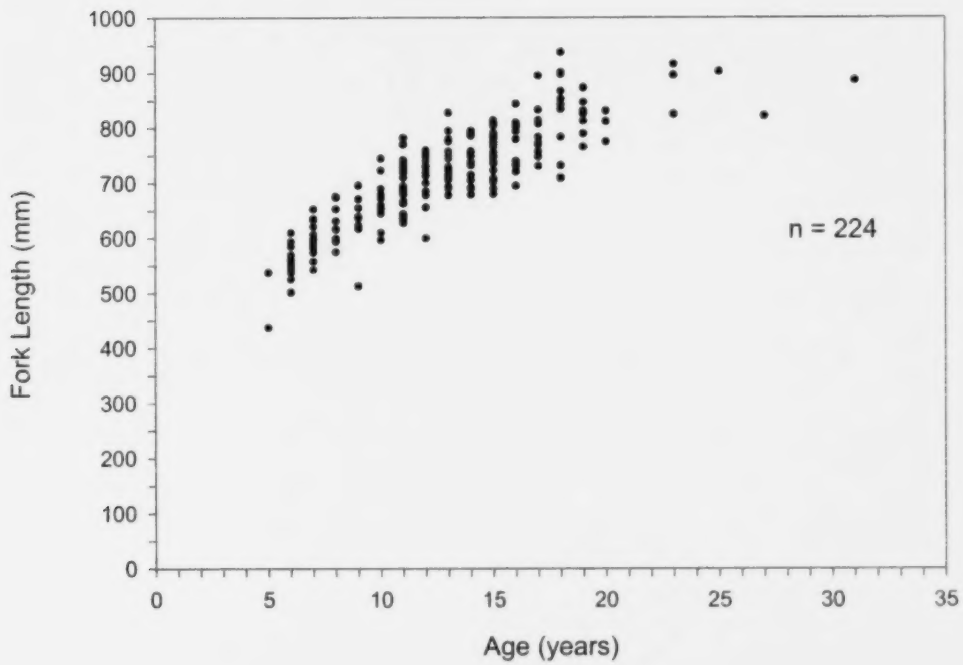


Fig. 14. Age frequency distribution for inconnu captured at Horseshoe Bend in 1993.



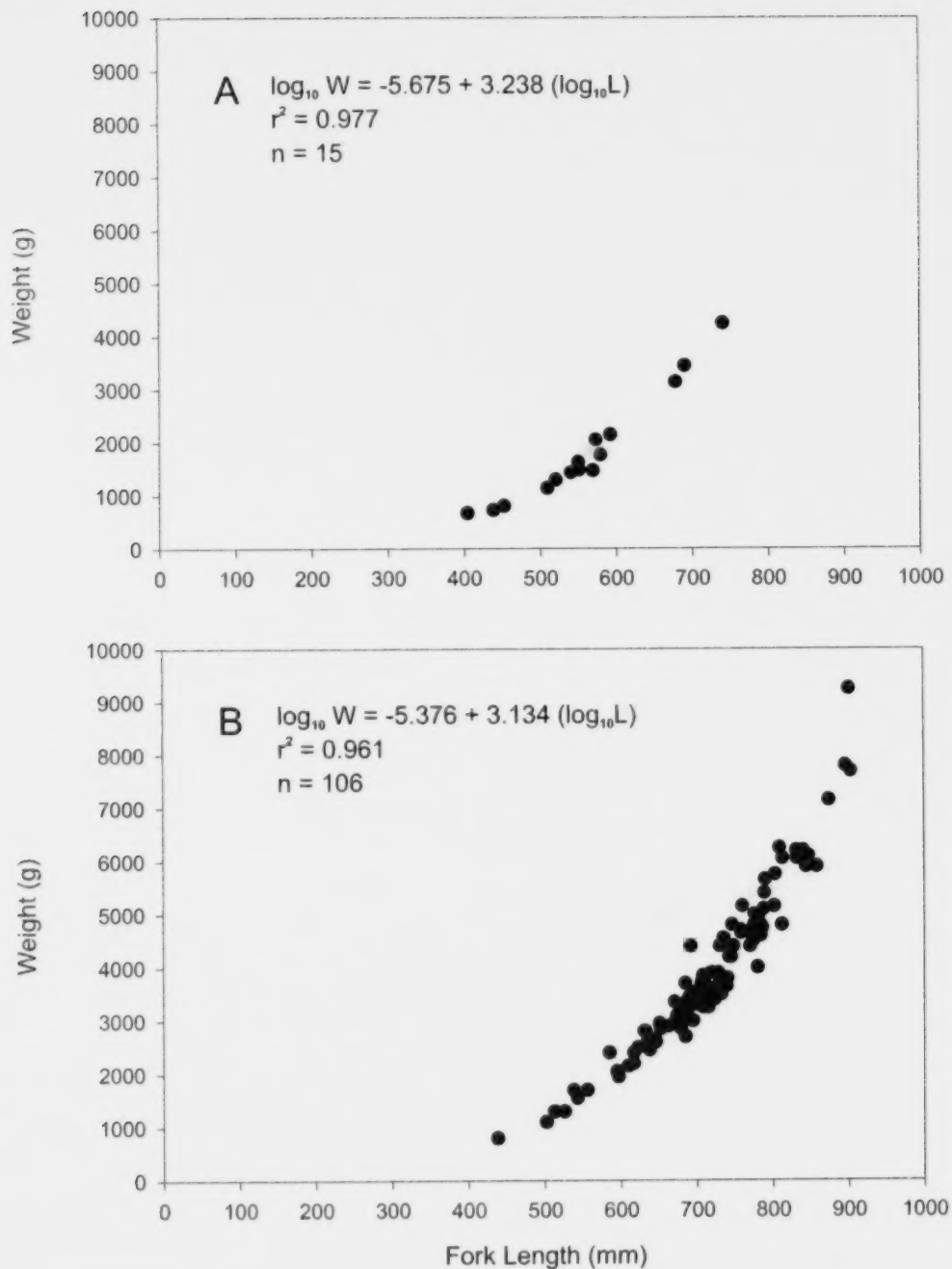


Fig. 16. Relationship between weight and fork length for inconnu captured at (A) Aklavik in 1992 and (B) Horseshoe Bend in 1993.

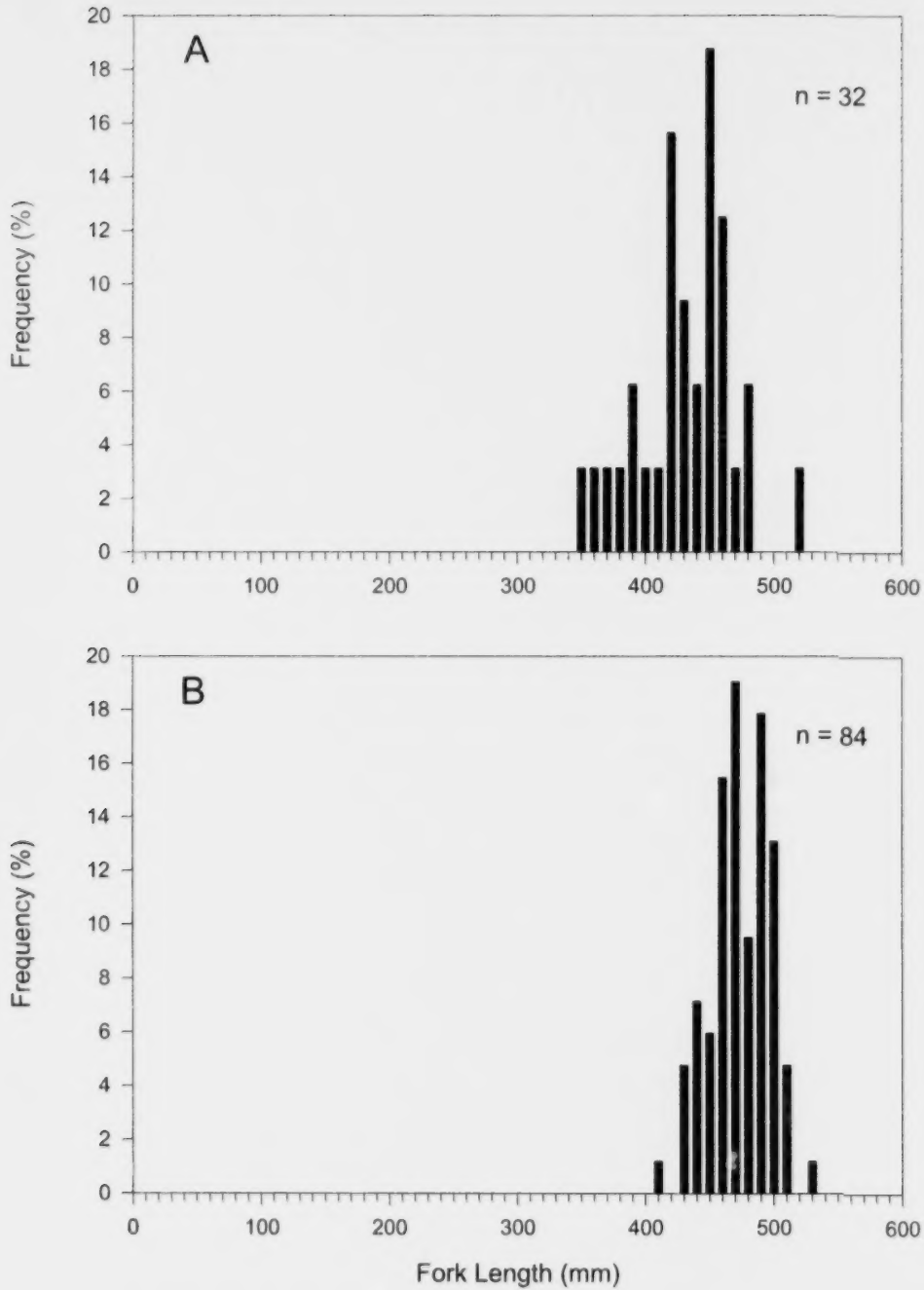


Fig. 17. Length frequency distributions for lake whitefish captured at (A) Aklavik in 1992 and (B) Horseshoe Bend in 1993.

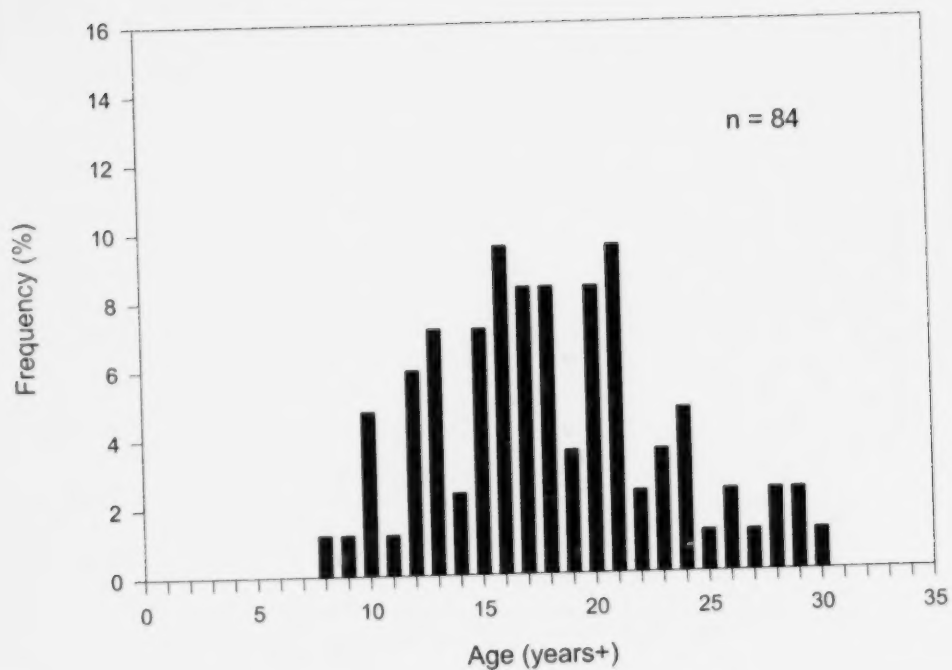


Fig. 18. Age frequency distribution for lake whitefish captured at Horseshoe Bend in 1993.

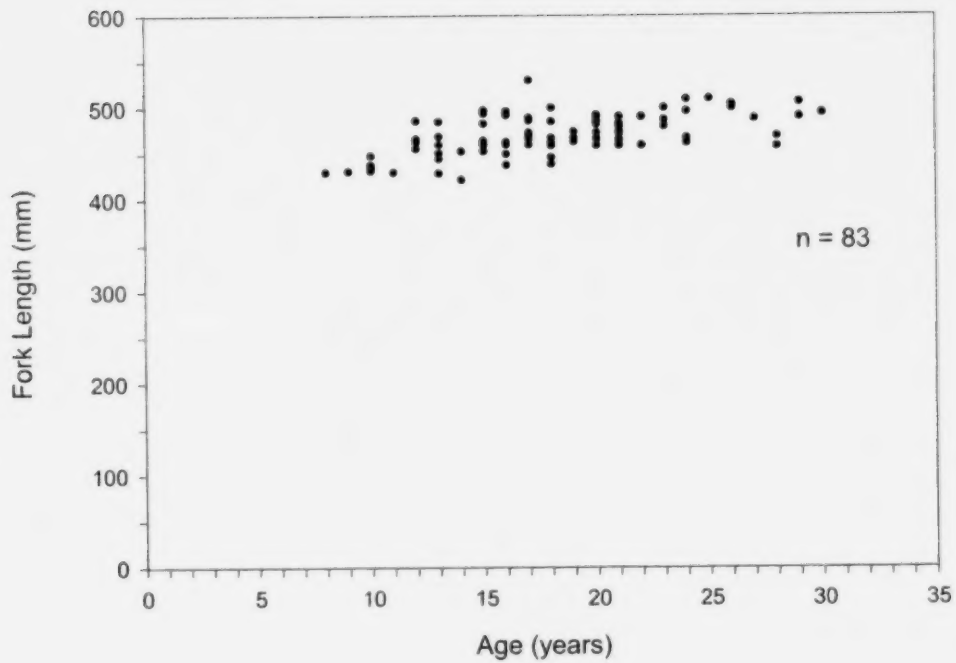


Fig. 19. Relationship between fork length and age for lake whitefish captured at Horseshoe Bend in 1993.

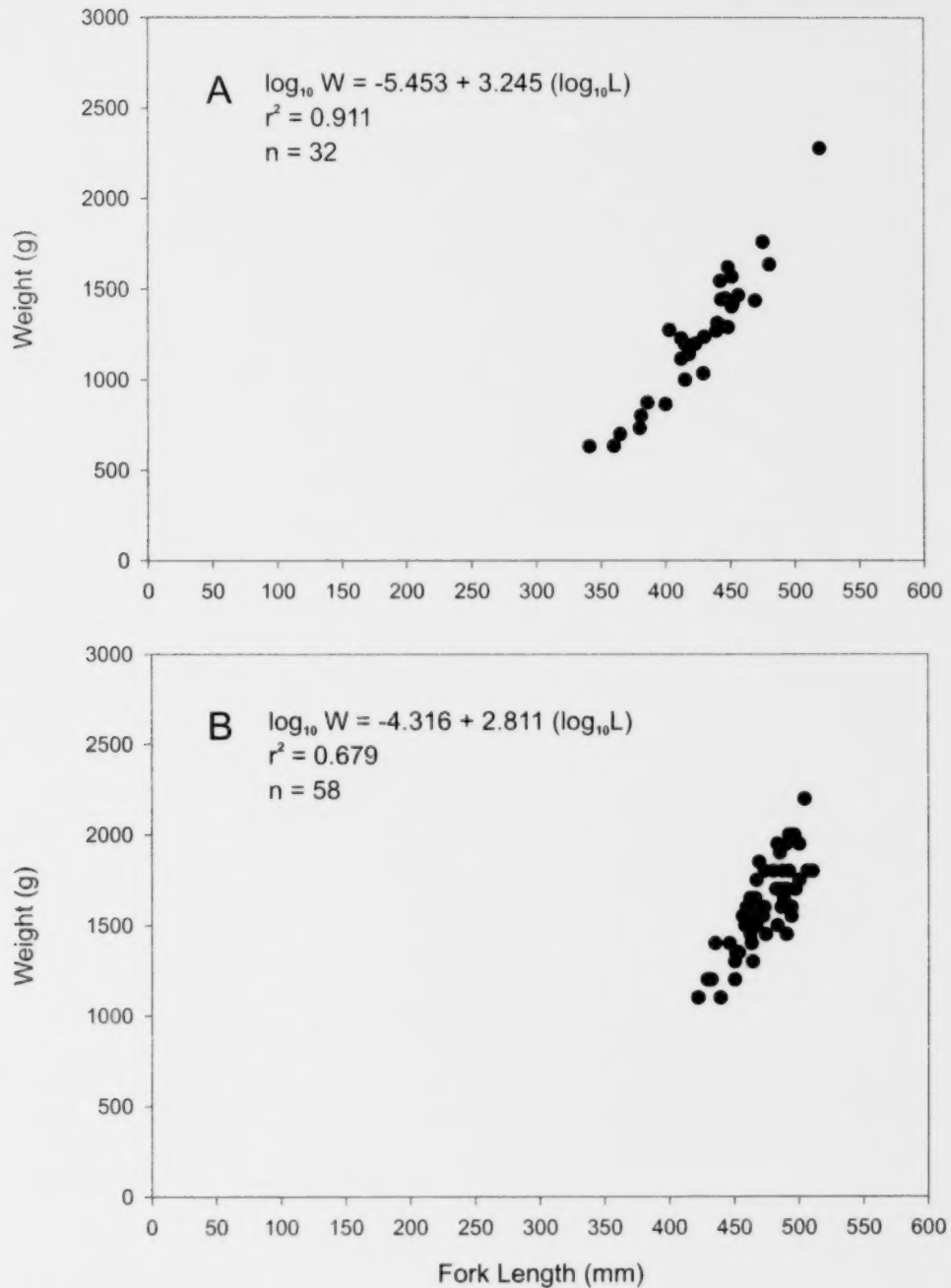


Fig. 20. Relationship between weight and fork length for lake whitefish captured at (A) Aklavik in 1992 and (B) Horseshoe Bend in 1993.

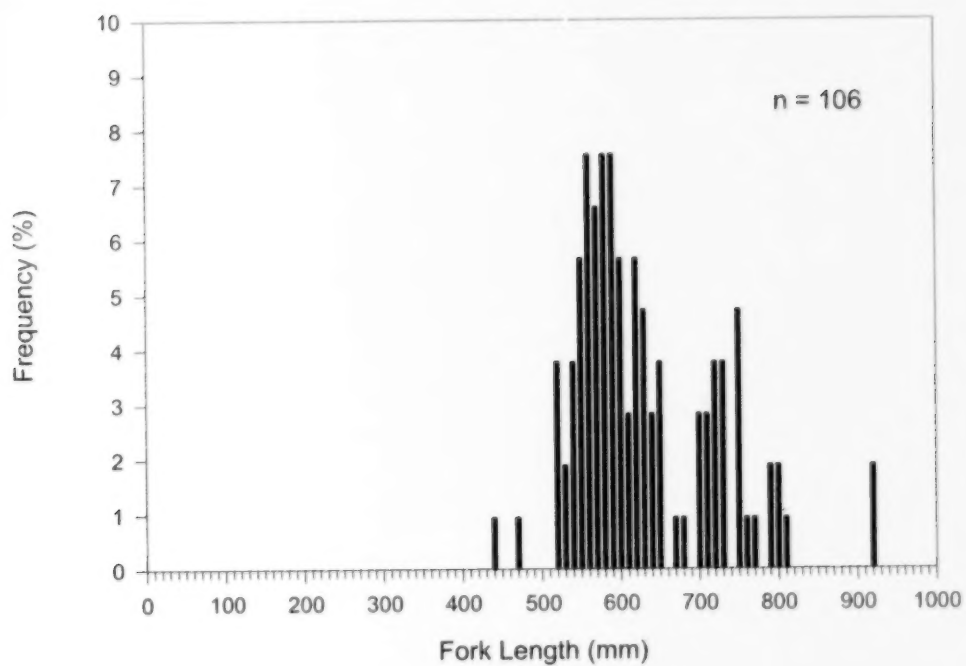


Fig. 21. Length frequency distribution for northern pike captured at Aklavik in 1992.

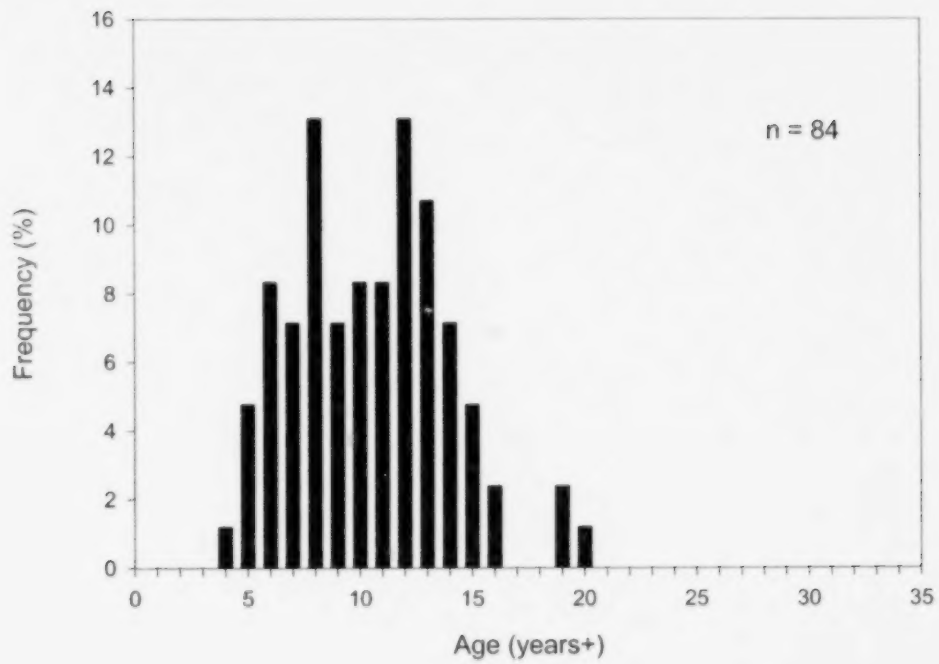


Fig. 22. Age frequency distribution for northern pike captured at Aklavik in 1992.

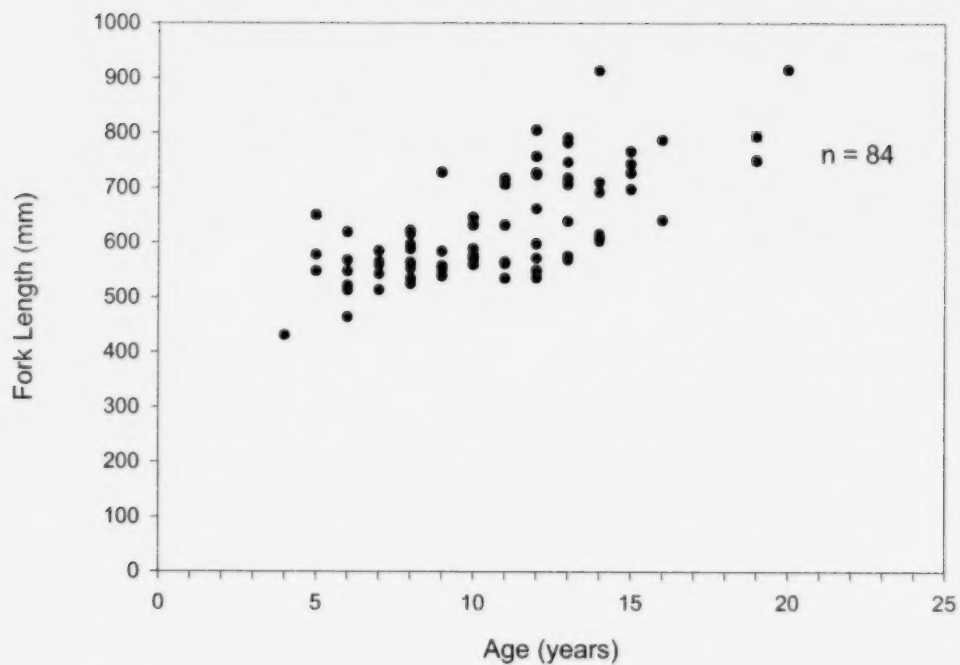
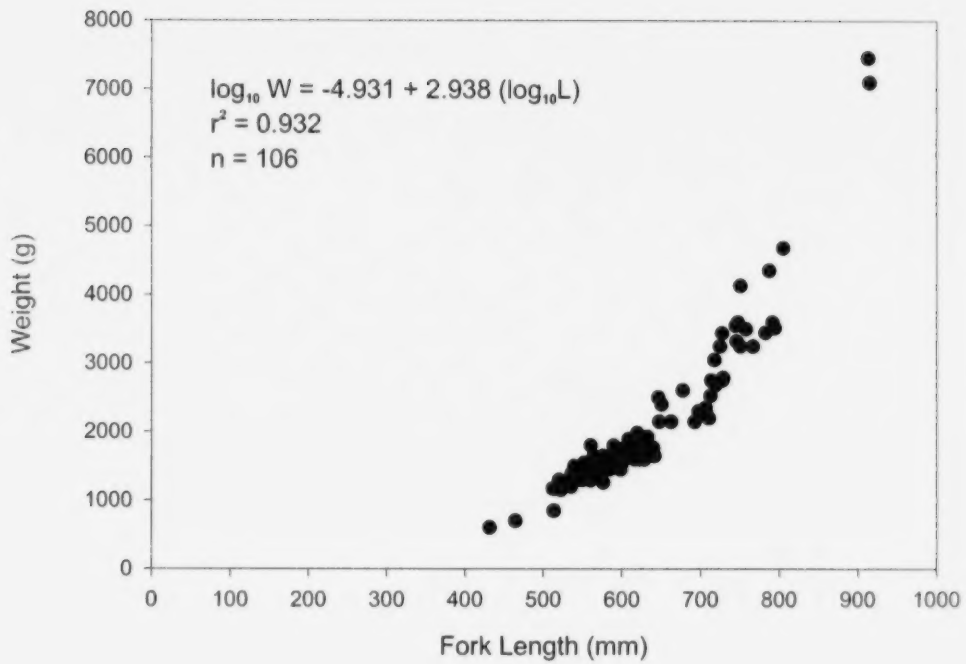


Fig. 23. Relationship between fork length and age for northern pike captured at Aklavik in 1992.



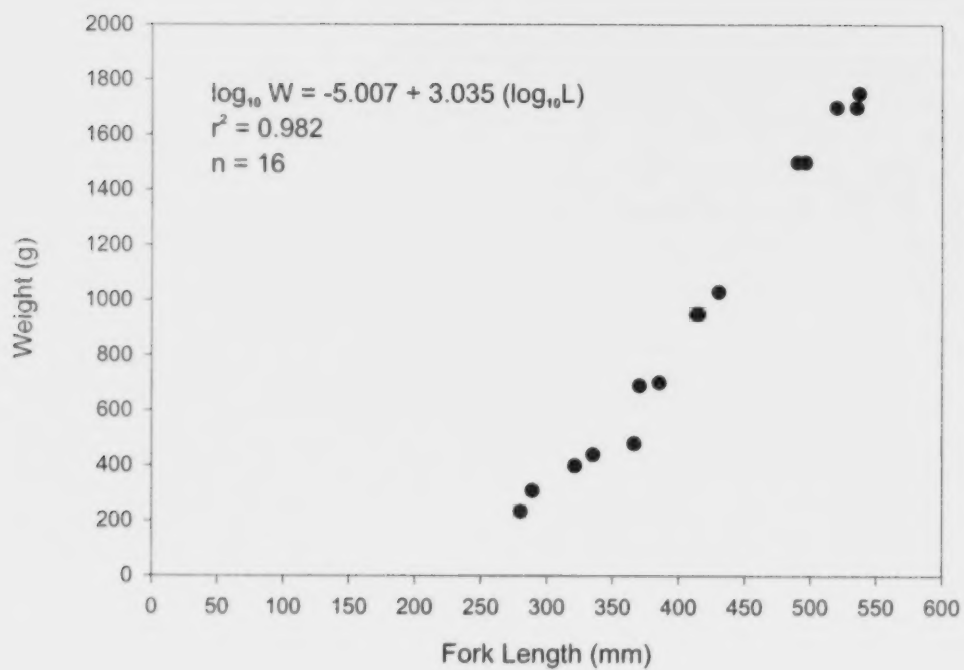


Fig. 25. Relationship between weight and fork length for Dolly Varden captured at Aklavik in 1992.

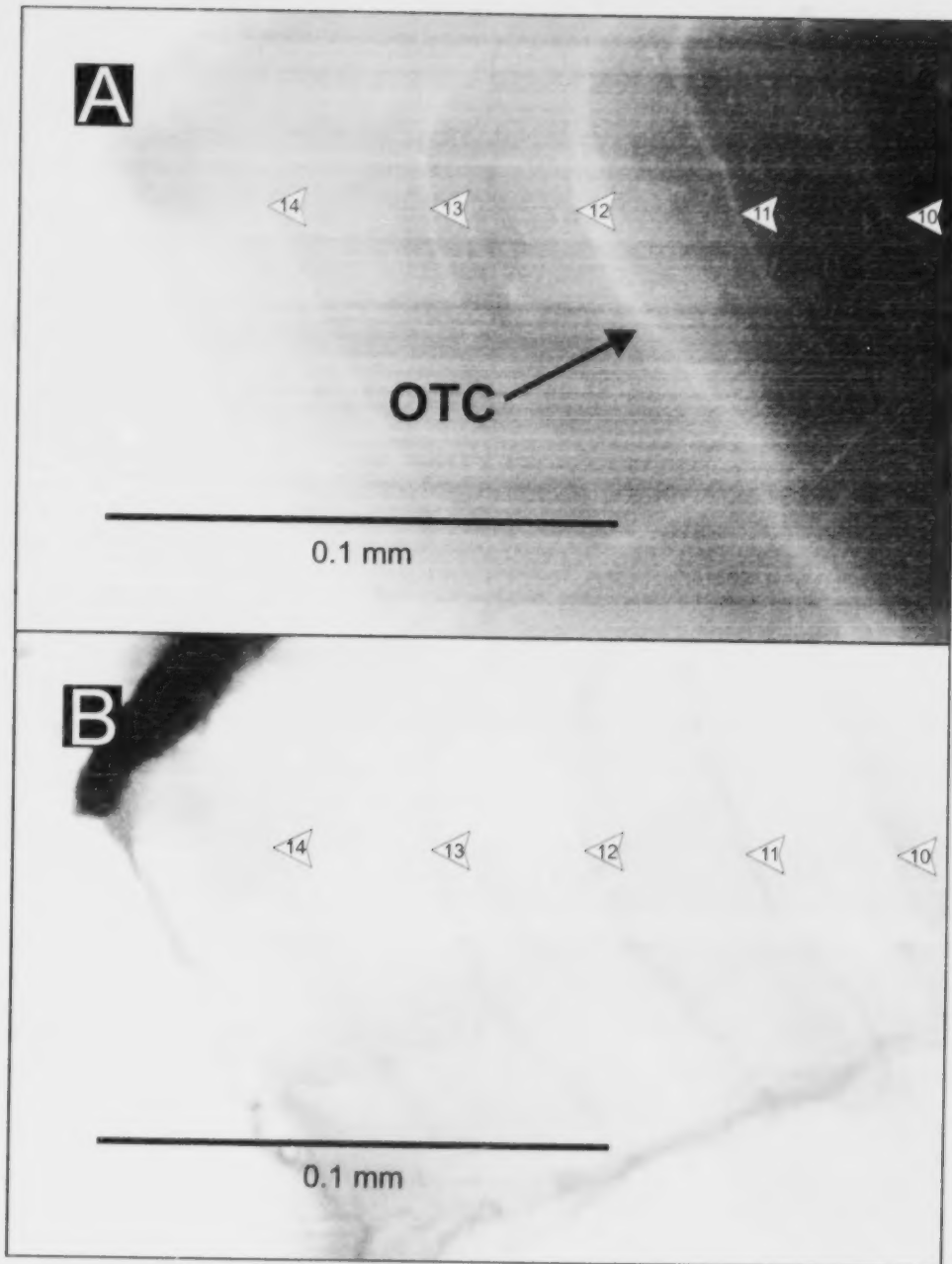


Fig. 26. Cross-section through an otolith from a broad whitefish tagged (#A0130/3), injected with oxytetracycline (OTC), released in September, 1992 and recaptured in September, 1995. (A) Under reflected ultraviolet light. (B) Transmitted white light. Annuli are indicated by arrowheads (age-at-recapture = 14+ years; not all annuli are shown). OTC mark is also indicated.

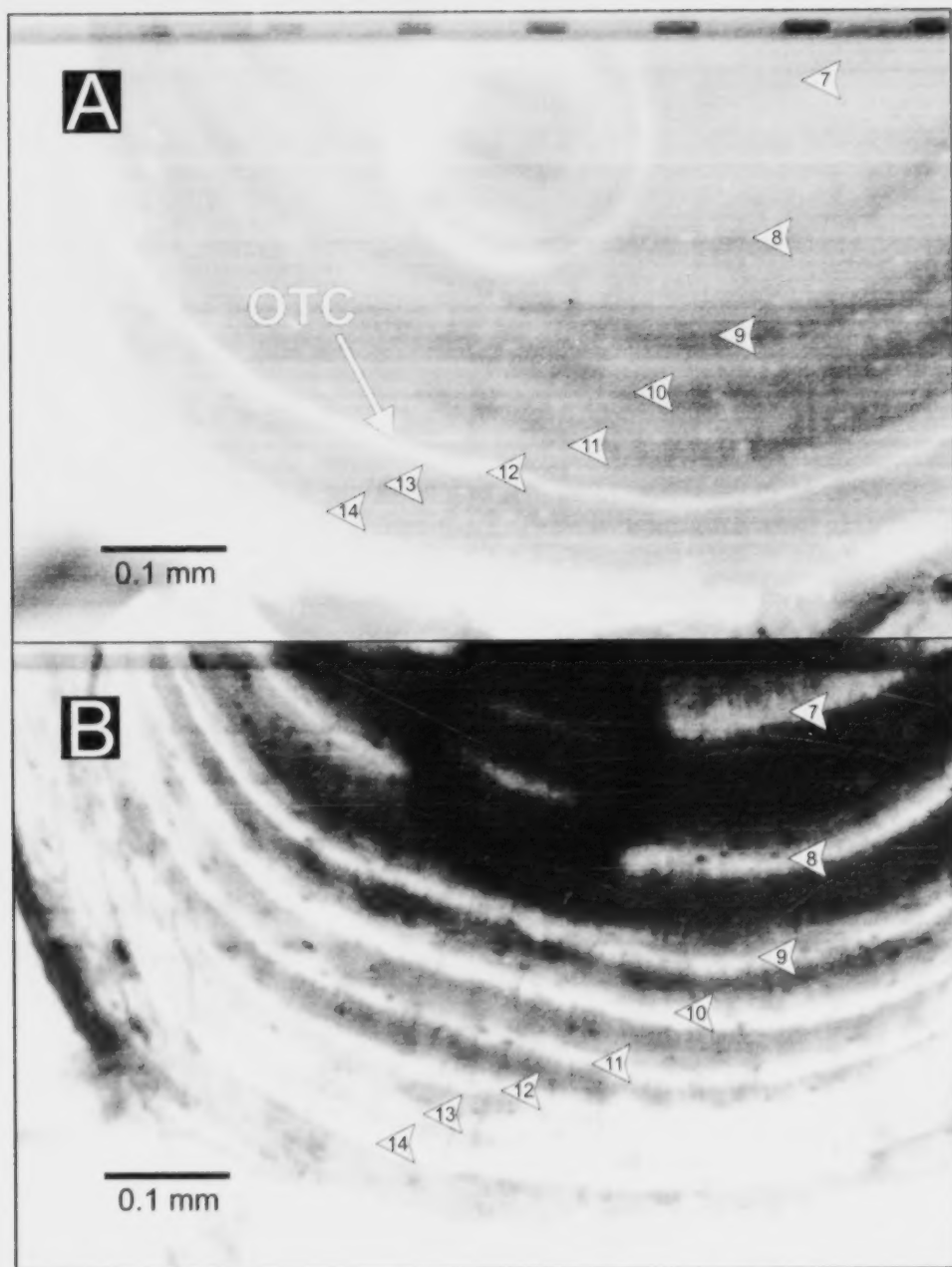


Fig. 27. Cross-section through a pelvic fin ray from a broad whitefish tagged (#A0130/3), injected with oxytetracycline (OTC), released in September, 1992 and recaptured in September, 1995. (A) Under reflected ultraviolet light. (B) Transmitted white light. Annuli are indicated by arrowheads (age-at-recapture = 14+ years; not all annuli are shown). OTC mark is also indicated.

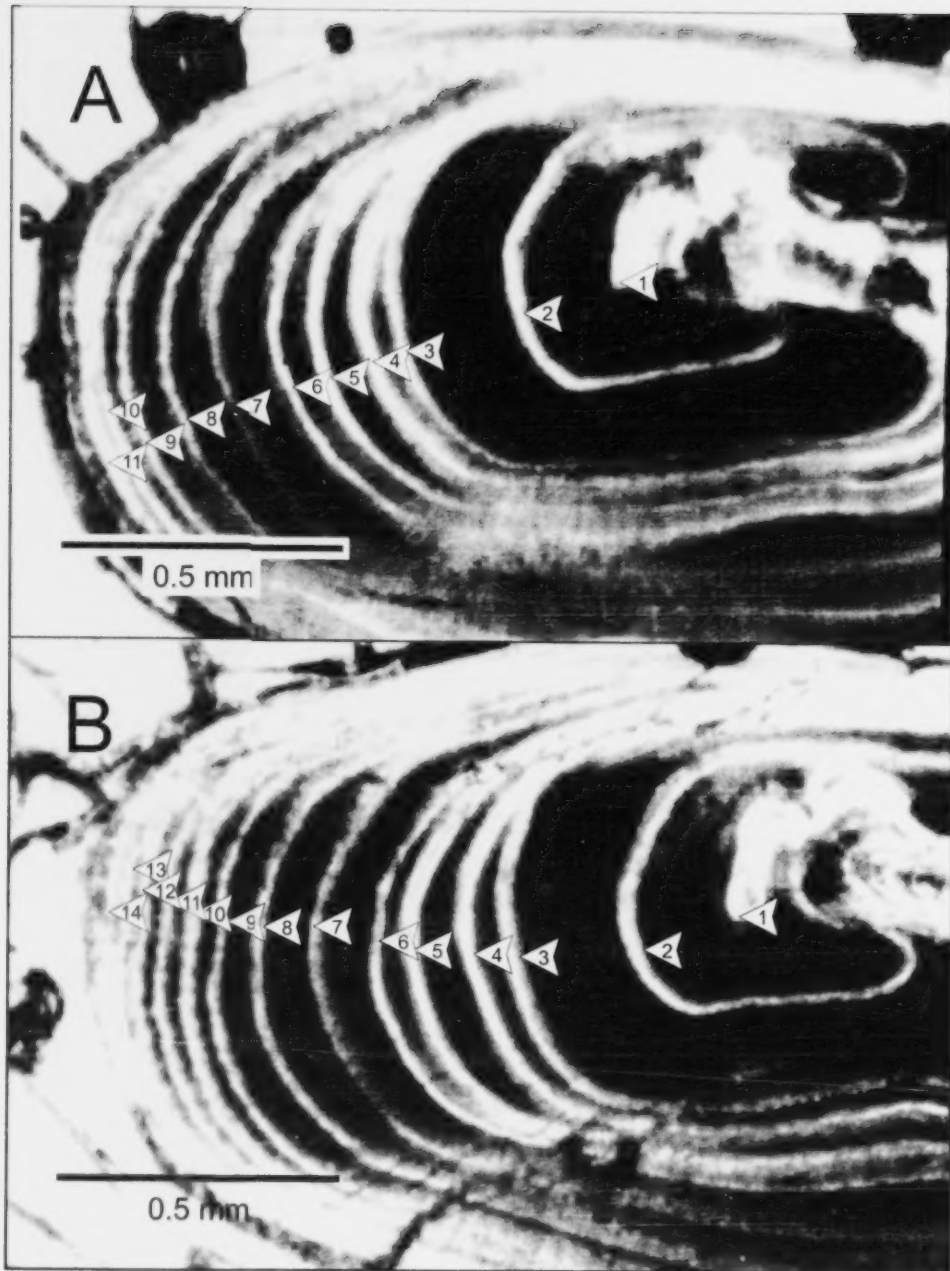


Fig. 28. Cross-section through a pelvic fin ray from a broad whitefish tagged (#A0130/3), fin-clipped and released in August, 1992 (A) and recaptured in September, 1995 (B). Annuli are indicated by arrowheads.

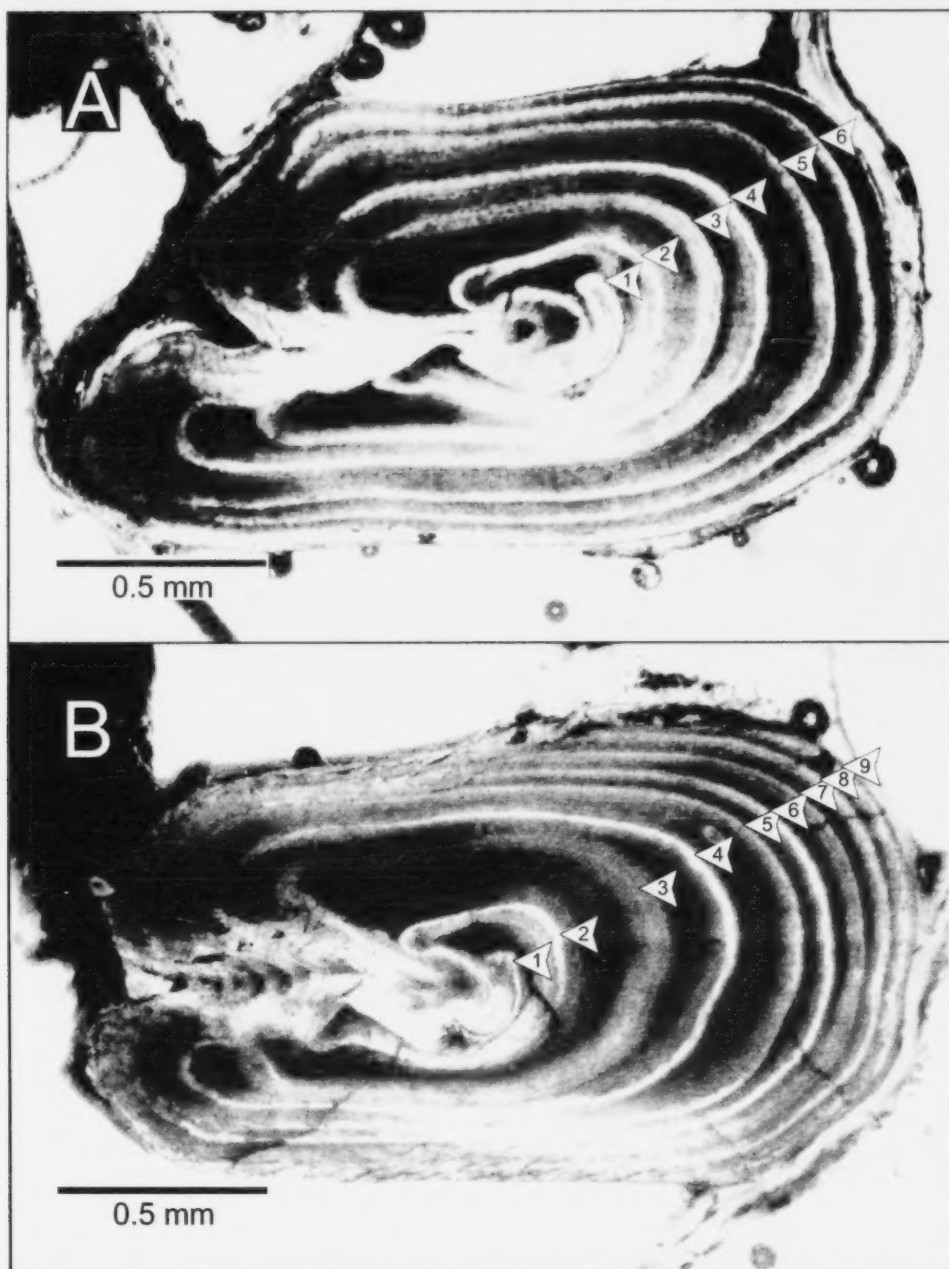


Fig. 29. Cross-section through a pelvic fin ray from an inconnu tagged (#A1841), fin-clipped and released on August 9, 1993 (A) and recaptured on July 18, 1996 (B). Annuli are indicated by arrowheads.

Appendix 1. Tag numbers, fork lengths, weights and pelvic fin ray ages for broad whitefish tagged at Aklavik, NT, August - September, 1992.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
1	A0001		485	1900	11	
2	A0002		505	2150	20	
3	A0003		470	1700	12	
4	A0004		483	1750	17	
5	A0005		538	2050	13	
6	A0006		482	1650	12	
7	A0007		491	1850	15	
8	A0008		497	1950	14	recaptured, Peel River, Oct. 1993
9	A0009		499	1900	12	recaptured, Peel River, 10 Oct. 1992
10	A0010		517	2350	10	
11	A0011		510	2000	8	recaptured, Peel River, 3 Nov. 1992
12	A0012		453	1600	15	
13	A0013		488	2150	8	
14	A0014		485	1950	9	
15	A0015		472	1750	13	recaptured, Arctic Red River, 5 Oct. 1992
16	A0016		422	1100	6	
17	A0017		484	2100	11	
18	A0018		480	1800	6	
19	A0019		454	1300	6	
20	A0020		475	2050	13	
21	A0021		527	2650	9	
22	A0022		486	1750	10	
23	A0023		479	1750	7	
24	A0024		407	850	5	
25	A0026		436	1050	8	
26	A0027		457	1350	7	recaptured, Trail River, 20 Oct. 1997
27	A0028		394	850	6	
28	A0030		430	1150	5	
29	A0031		500	2000	12	recaptured, Peel River, Oct. 1993
30	A0033		485	1800	13	
31	A0034		398	1050	5	
32	A0037		514	2100	14	
33	A0038		473	1500	11	
34	A0039		479	1700	13	
35	A0041		465	1500	13	
36	A0042		473	1300	14	
37	A0044		435	1150	6	
38	A0045		492	2050	11	
39	A0046		455	1400	9	
40	A0047		481	1850	15	
41	A0048		415	950	6	
42	A0049		460	1600	11	
43	A0050		471	1850	6	

Appendix 1. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
44	A0051		483	1900	15	
45	A0052		370	720	4	
46	A0054		454	1420	12	
47	A0058		509	2280	11	
48	A0059		472	1510	7	
49	A0063		494	1900	8	
50	A0064		409	1030	5	
51	A0070		506	1940	15	
52	A0072		485	1860	12	
53	A0073		462	1450	6	
54	A0076		474	1750	11	
55	A0077		439	1320	12	
56	A0078		469	1670	11	
57	A0079		420	1150	8	
58	A0080		486	1760	11	
59	A0081		438	1160	6	
60	A0082		462	1330	7	
61	A0083		457	1460	11	
62	A0084		435	1390	5	
63	A0086		433	1220	7	
64	A0087		399	900	8	recaptured, Peel River, 17 Oct. 1992
65	A0088	A0089 ¹	457	1700	6	
66	A0092	A0093 ¹	466	1450	14	
67	A0094	A0095 ¹	477	1900	11	
68	A0096	A0097 ¹	479	1750	6	
69	A0098	A0099 ¹	389	800	5	
70	A0100	A0101 ¹	465	1450	6	recaptured, Pokiak Channel, Sept. 1995
71	A0102	A0103 ¹	508	2400	11	
72	A0104	A0105 ¹	450	1450	8	
73	A0106	A0107 ¹	464	1700	6	
74	A0108	A0109 ¹	530	2150	21	
75	A0110	A0111 ¹	495	1850	9	recaptured, Pokiak Channel, Sept. 1995
76	A0112	A0113 ¹	462	1650	14	
77	A0114	A0115 ¹	421	1200	6	
78	A0117	A0118 ¹	493	2000	8	
79	A0119	A0120 ¹	470	1500	19	
80	A0121	A0122 ¹	468	1500	10	
81	A0123	A0124 ¹	490	1950	9	recaptured, East Channel, fall 1993
82	A0125	A0126 ¹	507	2050	10	
83	A0127	A0128 ¹	373	750	4	
84	A0130	A0133 ¹	488	1800	11	recaptured, Pokiak Channel, Sept. 1995
85	A0134	A0135 ¹	489	1450	22	recaptured, Peel River, 24 Sept. 1993
86	A0138	A0139 ¹	490	1950	14	
87	A0140	A0141 ¹	487	1750	10	

Appendix 1. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
88	A0142	A0143 ¹	462	1425	15	
89	A0144	A0145 ¹	498	2000	9	
90	A0147	A0148 ¹	471	1600	23	
91	A0149	A0150 ¹	436	1500	5	
92	A0151	A0152 ¹	448	1500	15	recaptured, Shingle Point, Aug. 1995
93	A0153	A0154 ¹	390	800	5	
94	A0155	A0156 ¹	448	1350	14	
95	A0157	A0158 ¹	488	1850	10	
96	A0159	A0160 ¹	426	1150	5	
97	A0161	A0162 ¹	493	1650	15	
98	A0163	A0164 ¹	470	1800	6	
99	A0165		400	1050	8	
100	A0251		452	1370	5	
101	A0252		456	1580	6	

¹ Fish injected with oxytetracycline.

Appendix 2. Tag numbers, fork lengths, weights and pelvic fin ages for broad whitefish tagged at Horseshoe Bend, NT, July - August, 1993.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
1	A0171		521		14	
2	A0178		475		13	
3	A0179		484		15	
4	A0180		565		14	
5	A0185		510		7	
6	A0194		562		14	
7	A0197		445		9	
8	A0198		500		17	
9	A0199		473		14	
10	A0200		465		15	
11	A0202		506		15	
12	A0203		473		12	
13	A0204		500		8	
14	A0205		511		15	
15	A0206		558		17	
16	A0207		561		17	
17	A0208		530		15	
18	A0209		500		10	
19	A0210		540		13	
20	A0211		514		15	
21	A0212		510		9	
22	A0213		453		7	
23	A0214		503		10	
24	A0215		475		8	
25	A0216		503		7	
26	A0217		485		17	
27	A0218		444		7	
28	A0221		505		8	
29	A0223		495		14	
30	A0224		519		14	
31	A0225		470		13	
32	A0226		477		14	
33	A0227		477		7	
34	A0228		498		10	
35	A0229		470		10	
36	A0230		512		11	
37	A0231		486		11	
38	A0232		507		12	
39	A0233		485		6	
40	A0234		468		6	
41	A0235		555		11	
42	A0236		462		8	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
43	A0237		524		15	
44	A0245		512		10	
45	A0246		500		8	
46	A0247		505		7	
47	A0248		478		7	
48	A0249		493		15	
49	A0253		445		8	
50	A0254		505		9	
51	A0255		483		19	
52	A0256		595		9	
53	A0257		445		18	
54	A0260		480		14	
55	A0261		495		15	
56	A0262		525		15	
57	A0263		484		15	
58	A0264		468		14	
59	A0265		494		8	
60	A0268		566		14	
61	A0270		477		12	
62	A0271		473		20	
63	A0272		479		12	
64	A0273		516		14	
65	A0274		504		13	
66	A0275		514		13	
67	A0276		463		6	
68	A0277		528		15	
69	A0278		511		10	
70	A0279		519		13	
71	A0280		492		9	
72	A0281		485		7	
73	A0283		535		14	
74	A0284		490		14	
75	A0285		548		11	
76	A0287		569		9	
77	A0288		515		14	
78	A0289		505		9	
79	A0290		545		12	
80	A0291		495		10	
81	A0293		535		12	
82	A0294		520		23	
83	A0295		500		15	
84	A0298		511		7	
85	A0299		490		15	
86	A0301		591		9	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
87	A0303		498		13	
88	A0304		510		9	
89	A0305		469		13	
90	A0307		525		11	
91	A0308		500		9	
92	A0309		557		10	
93	A0310		561		11	
94	A0311		470		9	
95	A0312		474		7	
96	A0313		454		15	
97	A0314		500		13	
98	A0315		495		16	
99	A0316		480		14	
100	A0317		-		11	
101	A0318		476		12	
102	A0319		539		14	
103	A0320		507		10	
104	A0321		496		9	
105	A0322		501		9	
106	A0324		545		12	
107	A0325		571		14	
108	A0327		-		8	
109	A0329		493		22	
110	A0330		534		11	
111	A0331		501		9	
112	A0332		539		8	
113	A0333		455		9	
114	A0334		474		15	
115	A0335		513		21	
116	A0336		500		15	
117	A0337		555		12	
118	A0338		504		13	
119	A0339		500		14	
120	A0340		478		13	
121	A0341		555		12	
122	A0343		474		12	
123	A0345		462		14	
124	A0346		555		15	
125	A0347		507		21	
126	A0348		488		14	
127	A0349		521		17	
128	A0350		497		7	
129	A1351		501		7	
130	A1352		555		19	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
131	A1353		507		10	
132	A1355		518		11	
133	A0399		527		8	
134	A0351		503		11	
135	A0352		530		18	
136	A0353		525		9	
137	A0354		500		-	
138	A0355		530		15	
139	A0356		535		14	
140	A0359		480		12	
141	A0360		506		14	
142	A0361		533		15	
143	A0364		535		14	
144	A0365		487		14	
145	A0366		445		6	
146	A0367		510		7	
147	A0368		465		10	
148	A0369		466		9	
149	A0370		540		14	
150	A0371		486		9	
151	A0372		492		9	
152	A0373		491		18	
153	A0374		555		14	
154	A0375		470		7	
155	A0377		521		13	
156	A0380		523		11	
157	A0381		549		12	
158	A0382		527		6	
159	A0383		490		16	
160	A0384		500		20	
161	A0385		513		13	
162	A0386		435		7	
163	A0387		462		8	
164	A0389		513		13	
165	A0390		548		27	
166	A0391		502		14	
167	A0393		535		18	
168	A0395		500		15	
169	A0396		529		14	
170	A0398		490		9	
171	A0401		608		12	
172	A0402		514		8	
173	A0403		470		15	
174	A0404		552		13	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
175	A0405		485		11	
176	A0406		472		11	
177	A0408		485		11	
178	A0410		537		10	
179	A0411		572		20	
180	A0412		519		14	
181	A0413		559		12	
182	A0414		500		9	
183	A0415		517		9	
184	A0417		530		15	recap'd, Ramparts Rapids, 8 Aug. 1993
185	A0419		508		11	
186	A0420		530		16	
187	A0421		475		10	
188	A0422		495		10	
189	A0423		480		15	
190	A0426		485		10	
191	A0427		476		14	
192	A0428		506		15	
193	A0429		555		14	
194	A0430		474		20	
195	A0431		504		10	
196	A0433		504		15	
197	A0435		554		22	
198	A0436		445		8	
199	A0437		505		11	
200	A0438		517		11	
201	A0439		487		13	
202	A0440		530		14	
203	A0441		488		10	
204	A0443		462		7	
205	A0444		485		9	
206	A0445		500		18	
207	A0446		535		12	
208	A0447		520		17	
209	A0451		507		17	
210	A0453		485		8	
211	A0454		434		8	
212	A0457		531		21	
213	A0458		510		13	
214	A0461		574		14	
215	A0462		556		15	
216	A0465		480		14	
217	A0466		500		14	
218	A0467		475		7	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
219	A0468		535		16	
220	A0469		520		17	
221	A0470		460		14	
222	A0471		553		20	
223	A0472		510		14	
224	A0473		525		12	
225	A0474		506		7	
226	A0475		533		9	
227	A0476		515		12	
228	A0477		460		19	
229	A0478		503		-	
230	A0479		489		8	
231	A0480		520		16	
232	A0481		476		14	
233	A0482		535		13	
234	A0484		462		11	
235	A0485		535		15	
236	A0486		455		16	
237	A0487		505		15	
238	A0491		505		16	
239	A0492		560		12	
240	A0493		512		13	
241	A0494		531		15	
242	A0495		490		8	
243	A0496		500		14	
244	A0497		463		12	
245	A0498		519		8	
246	A0499		491		9	
247	A0501		463		7	
248	A0502		510		10	
249	A0503		467		13	
250	A0504		465		-	
251	A0505		493		13	
252	A0506		483		18	
253	A0508		507		15	
254	A0509		522		13	
255	A0510		490		14	
256	A0511		504		14	
257	A0512		511		14	
258	A0513		521		22	
259	A0514		558		15	
260	A0515		511		10	
261	A0516		588		11	
262	A0517		490		15	

Appendix 2. Continued.

No.	Tag No	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
263	A0518		463		15	
264	A0519		476		9	
265	A0520		494		14	
266	A0522	A0523 [†]	465		10	
267	A0524		485		7	
268	A0525	A0526 [†]	463		8	
269	A0527	A0528 [†]	525		16	
270	A0531	A0532 [†]	508		15	
271	A0533		496		7	
272	A0534		485		8	
273	A0535		583		17	
274	A0536		500		12	
275	A0538	A0539 [†]	472		14	
276	A0540	A0541 [†]	453		9	
277	A0542		467		14	
278	A0543		485		15	
279	A0544	A0545 [†]	535		13	
280	A0548		518		9	
281	A0549	A0550 [†]	456		17	
282	A0551		472		9	
283	A0552		520		18	
284	A0553		510		14	
285	A0554	A0555 [†]	518		9	
286	A0556	A0557 [†]	514		14	
287	A0558	A0559 [†]	465		7	
288	A0560		493		9	
289	A0561		480		13	
290	A0562		550		12	
291	A0564	A0565 [†]	567		16	
292	A0567		514		14	
293	A0568	A0569 [†]	505		12	
294	A0570	A0571 [†]	470		16	
295	A0572	A0573 [†]	475		10	
296	A0574	A0575 [†]	505		14	
297	A0578	A0579 [†]	446		9	
298	A0580	A0581 [†]	465		14	
299	A0582	A0583 [†]	500		7	
300	A0584	A0585 [†]	520		12	
301	A0586	A0587 [†]	464		9	
302	A0588	A0589 [†]	510		14	
303	A0592	A0593 [†]	485		9	
304	A0594	A0595 [†]	477		11	
305	A0596	A0597 [†]	535		-	
306	A0598		481		11	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
307	A0599	A0600 ¹	495		10	
308	A0563		546		15	
309	A0616	A0617 ¹	515		16	
310	A0615		480		24	
311	A0601	A0602 ¹	480		12	
312	A0603	A0604 ¹	471		9	
313	A0614		467		22	
314	A0605	A0606 ¹	510		14	
315	A0607	A0608 ¹	476		15	
316	A0609	A0610 ¹	498		13	
317	A0611	A0612 ¹	536		21	
318	A0618	A0619 ¹	473		12	
319	A0620		536		-	
320	A0622	A0624 ¹	520		10	
321	A0625		500		12	
322	A0627		480		10	
323	A0628		459		15	
324	A0629		500		10	
325	A0633		521		9	
326	A0632		469		16	
327	A0631		537		21	
328	A0630	A0634 ¹	500		15	
329	A0635	A0636 ¹	498		9	
330	A0637		482		10	
331	A0638	A0639 ¹	489		14	
332	A0640		490		9	
333	A0641		460		11	
334	A0642	A0643 ¹	480		15	
335	A0645		498		12	
336	A0647	A0648 ¹	456		12	
337	A0650	A0651 ¹	520		14	
338	A0652	A0653 ¹	478		12	
339	A0657	A0658 ¹	473		22	
340	A0659	A0660 ¹	494		13	
341	A0661		463		15	
342	A0662	A0663 ¹	517		12	
343	A0664	A0665 ¹	467		9	
344	A0670	A0671 ¹	470		9	
345	A0672	A0673 ¹	505		16	
346	A0674	A0675 ¹	488		10	
347	A0676	A0677 ¹	594		-	
348	A0678	A0679 ¹	505	2300	14	
349	A0682	A0683 ¹	500	1950	14	
350	A0684	A0685 ¹	484	1750	15	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
351	A0686	A0687 ¹	483	2050	15	
352	A0692	A0693 ¹	493	2050	12	
353	A0694	A0695 ¹	508	2300	11	
354	A0696	A0697 ¹	614	3800	16	
355	A0698		527	2700	12	
356	A0699		460	1650	19	
357	A0700		520	2225	14	
358	A0701		570	3150	17	
359	A0702	A0703 ¹	514	2400	16	
360	A0704		489	1950	16	
361	A0705		477	1750	16	
362	A0706		458	1650	7	
363	A0707	A0708 ¹	487	2100	15	
364	A0712		474	1850	7	
365	A0713		505	2200	11	
366	A0714	A0715 ¹	473	1800	11	
367	A0716	A0717 ¹	488	1950	16	
368	A0718	A0719 ¹	510	2050	-	
369	A0720		500	2000	15	
370	A0721	A0722 ¹	526	1900	10	
371	A0723		485	1850	13	
372	A0724	A0725 ¹	487	1850	14	
373	A0726		488	2100	-	
374	A0727		515	2100	23	
375	A0728		540	2350	15	
376	A0729		496	1850	14	
377	A0730		517	2350	16	
378	A0731		502	2250	11	recap'd, Ramparts Rapids, 8 Aug. 1993
379	A0732		502	2200	15	
380	A0733		498	2000	12	
381	A0734		458	1450	-	
382	A0735		550	2400	14	
383	A0736		481	1800	10	
384	A0737	A0738 ¹	544	3500	11	
385	A0741	A0742 ¹	523	2250	15	
386	A0743	A0744 ¹	463	1450	13	
387	A0745	A0746 ¹	498	1800	10	
388	A0747	A0748 ¹	474	1750	9	
389	A0749		494	1600	6	
390	A0750		489	1800	15	recap'd, Arctic Red River, 8 Oct. 1993
391	A0751	A0752 ¹	505	2000	18	
392	A0756		480	1650	8	recap'd, Horseshoe Bend, 17 Sept. 1993
393	A0757		500	2000	9	
394	A0758		512	2000	15	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
395	A0759		495	1950	10	
396	A0760		505	1700	18	
397	A0761		525	2700	11	
398	A0762		475	1950	10	
399	A0763	A0764 ¹	495	2100	14	
400	A0765	A0766 ¹	498	2400	12	
401	A0769		536	2550	15	
402	A0771	A0772 ¹	478	1750	16	
403	A0773	A0774 ¹	455	1600	11	
404	A0776		454	1550	7	
405	A0777		466	1500	13	
406	A0778		460	1500	17	
407	A0779	A0780 ¹	490	1750	14	
408	A0781	A0782 ¹	555	2600	14	
409	A0784		553	2850	12	
410	A0785		494	1550	15	
411	A0786		525	2400	15	
412	A0787		516	2300	15	
413	A0788		485	1550	14	
414	A0789		556	2600	15	
415	A0790		475	1800	12	
416	A0791		506	2050	9	
417	A0792		501	1850	14	
418	A0793		501	2000	11	
419	A0795		498	1900	15	
420	A0796		505	2050	14	
421	A0797		488	2000	11	
422	A0798		475	1850	-	
423	A0801		508	2250	-	
424	A0802		494	1900	10	
425	A0803		476	1750	10	
426	A0804		474	1800	7	
427	A0805		545	2850	13	recaptured, Tuktoyaktuk, 22 Jul. 1994
428	A0806		529	2150	14	
429	A0807		468	1750	10	
430	A0808		500	1850	14	recaptured, Peel River, Oct. 1993
431	A0810		510	2300	15	
432	A0811		499	1950	14	
433	A0812		493	2000	8	
434	A0813		489	1850	10	recaptured, Peel River, 26 Oct. 1993
435	A0814		465	1800	13	
436	A0815		492	2000	10	
437	A0816		437	1400	7	
438	A0818		485	1500	7	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
439	A0819		590	3250	13	
440	A0820		501	2100	10	
441	A0821		455	1500	8	
442	A0822		496	1850	10	
443	A0823		507	1800	10	
444	A0824		476	1950	8	
445	A0825		490	1850	14	
446	A0826		432	1550	15	
447	A0828		500	1800	11	
448	A0829		455	1550	10	
449	A0830		495	2300	10	
450	A0831		516	2400	24	
451	A0832		537	2350	13	
452	A0833		482	1900	7	
453	A0834		480	1750	10	
454	A0835		546	2150	9	
455	A0836		480	1750	13	
456	A0837		513	2400	14	
457	A0838		490	1600	14	
458	A0839		504	1950	14	
459	A0840		488	2050	10	
460	A0841		524	2100	15	
461	A0842		520	2250	13	
462	A0843		490	1900	16	
463	A0844		501	2100	12	
464	A0845		501	1950	14	
465	A0846		479	1750	16	
466	A0847		495	2100	14	
467	A0848		492	1950	15	
468	A0849		479	1950	13	
469	A0850		500	2200	17	
470	A0851		500	2050	10	
471	A0852		494	2050	7	
472	A0853		500	2100	13	
473	A0854		474	1500	10	
474	A0855		533	2350	12	
475	A0856		481	1850	18	
476	A0857		530	2150	-	
477	A0859		522	2350	-	
478	A0860		485	1900	14	
479	A0861		481	1600	14	
480	A0864		496	1550	9	
481	A0865		459	1450	12	
482	A0866		490	2000	15	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
483	A0867		505	2350	17	
484	A0868		490	2050	16	
485	A0869		555	2700	12	
486	A0870		519	2350	14	
487	A0871		463	1750	14	
488	A0872		474	1700	10	
489	A0873		511	2450	11	
490	A0875		502	1900	12	
491	A0876		487	1850	15	recaptured, Arctic Red River, 1 Nov. 1993
492	A0880		510	2400	18	
493	A0881		496	1950	15	
494	A0882		493	1600	23	
495	A0883		508	2150	22	
496	A0884		460	1750	13	
497	A0885		516	2200	15	
498	A0887		500	2100	11	
499	A0888		474	1750	10	
500	A0889		500	2350	11	
501	A0890		457	1700	9	
502	A0892		511	2000	16	
503	A0893		475	1950	8	
504	A0894		513	2200	14	
505	A0896		467	1550	-	
506	A0897		480	1850	10	
507	A0898		604	3100	13	
508	A0899		521	2350	14	
509	A0900		523	2175	14	
510	A0901		500	1900	13	
511	A0902		468	1600	8	
512	A0904		473	1700	9	
513	A0905		495	2150	7	
514	A0906		519	2350	16	
515	A0907		493	1800	12	
516	A0908		492	1450	-	
517	A0909		495	1850	9	
518	A0910		480	2000	14	
519	A0911		476	1400	12	
520	A0912		480	1650	9	
521	A0913		499	2100	14	
522	A0914		529	2050	13	
523	A0915		467	1650	15	
524	A0916		473	1800	10	
525	A0917		473	1950	7	
526	A0919		484	1950	12	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
527	A0920		500	2350	13	
528	A0921		480	1650	14	
529	A0922		487	2200	15	
530	A0923		473	1550	15	
531	A0924		555	2550	13	
532	A0925		489	2050	14	
533	A0926		494	2000	12	
534	A0928		504	2000	14	
535	A0930		455	1500	9	
536	A0931		518	2500	15	
537	A0932		498	2150	12	
538	A0933		535	2400	12	
539	A0934		485	1750	9	
540	A0935		490	2150	15	
541	A0936		532	2200	7	
542	A0937		505	2150	15	
543	A0938		544	2600	11	
544	A0940		488	2000	11	
545	A0941		493	2000	10	
546	A0942		578	3250	20	recap'd, Pokiak Channel, summer 1994
547	A0943		465	1550	7	
548	A0944		487	2000	9	
549	A0945		496	1650	13	
550	A0946		582	2650	11	
551	A0947		507	1700	11	
552	A0948		499	1750	23	
553	A0949		500	2200	15	
554	A0950		468	1550	20	
555	A0951		467	1500	15	
556	A0952		503	1850	7	
557	A0953		485	2900	14	
558	A0954		533	2400	15	
559	A0955		504	2100	13	
560	A0956		523	2150	12	
561	A0957		535	2400	14	
562	A0958		475	1900	9	
563	A0959		484	1750	10	recaptured, Horseshoe Bend, fall 1993
564	A0961		494	2000	8	
565	A0962		523	2100	13	
566	A0963		484	2000	11	
567	A0964		460	1350	9	
568	A0965		550	2050	-	
569	A0966		464	1450	8	
570	A0967		474	1850	6	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
571	A0968		522	2500	15	
572	A0969		537	2400	13	
573	A0970		489	2150	13	
574	A0971		505	1950	7	
575	A0972		530	2550	14	
576	A0973		490	1900	15	
577	A0974		491	2200	9	
578	A0975		533	1700	14	
579	A0976		566	2950	22	
580	A0977		480	1800	8	
581	A0978		445	1400	7	
582	A0979		507	1900	12	
583	A0980		608	3350	19	
584	A0981		538	2300	13	
585	A0982		524	2200	10	
586	A0983		483	1700	12	
587	A0984		511	2000	14	
588	A0985		472	1800	8	
589	A0986		537	2350	-	
590	A0987		548	2600	15	
591	A0988		461	1600	15	
592	A0989		449	1750	8	
593	A0990		515	1900	14	
594	A0992		524	2650	11	
595	A0993		450	1350	15	
596	A0994		449	1400	11	
597	A0995		500	2050	14	
598	A0996		518	2300	13	
599	A0997		477	1600	14	
600	A0998		478	1800	15	
601	A1252		538	2100	14	
602	A1253		527	2400	15	
603	A1254		500	2000	11	
604	A1256		483	2000	17	
605	A1257		544	3000	13	
606	A1259		449	2800	9	
607	A1260		565	3600	16	
608	A1261		525	2200	18	
609	A1262		519	2500	15	
610	A1263		505	2150	8	
611	A1264		486	1900	10	
612	A1265		505	1700	22	
613	A1266		440	1450	6	
614	A1267		475	1600	12	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
615	A1270		483	1800	14	recap'd, Arctic Red River, 15 Aug. 1993
616	A1273		495	2300	13	
617	A1274		550	2500	14	
618	A1275		490	2100	12	
619	A1276		492	1750	10	
620	A1277		484	2000	9	
621	A1278		510	2000	17	
622	A1279		477	1850	14	
623	A1281		515	2400	15	
624	A1282		514	2500	8	
625	A1283		523	2400	8	
626	A1284		545	2400	13	
627	A1285		586	3350	21	
628	A1286		449	1450	10	
629	A1289		497	1800	10	
630	A1295		482	1900	12	
631	A1297		503	2300	12	
632	A1298		532	2400	14	
633	A1299		478	1500	9	
634	A1300		500	2200	20	
635	A1302		548	2500	10	
636	A1301		477	1700	14	
637	A1304		520	2650	15	
638	A1305		494	2150	9	
639	A1306		488	1600	8	
640	A1308		562	3000	12	
641	A1309		500	4150	9	
642	A1310		549	2400	13	
643	A1311		473	1850	10	
644	A1312		479	1900	17	
645	A1313		575	3650	11	
646	A1314		530	2300	14	
647	A1315		481	1650	18	
648	A1316		527	2650	12	
649	A1317		441	1500	7	
650	A1318		468	1550	10	
651	A1319		475	1750	14	
652	A1320		458	1500	9	
653	A1321		578	2900	16	
654	A1322		523	2300	14	
655	A1324		460	1350	10	
656	A1325		490	1700	9	
657	A1326		544	2550	15	
658	A1327		497	1900	15	recaptured, East Channel, 9 Aug. 1993

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
659	A1328		465	1450	14	
660	A1329		511	2500	16	
661	A1330		514		-	
662	A1332		555		12	
663	A1333		509	1850	17	
664	A1334		554	2550	13	
665	A1335		493	2100	12	
666	A1336		497	2250	-	
667	A1337		497	2300	16	
668	A1338		451	1750	14	
669	A1339		479	1550	9	
670	A1340		539	2150	11	
671	A1341		488	2100	12	
672	A1342		493		10	
673	A1343		503		14	
674	A1344		512		16	
675	A1345		481		15	
676	A1346		500		11	
677	A1347		461		7	
678	A1348		461		10	
679	A1349		506		11	
680	A1404		483		11	
681	A1405		520		15	
682	A1406		508		9	
683	A1407		524		14	
684	A1416		488		9	
685	A1418		469		7	
686	A1419		483		10	
687	A1420		459		17	
688	A1421		485		13	
689	A1424		464		-	
690	A1427		500		21	
691	A1430		524		-	
692	A1431		494		10	
693	A1432		527		19	
694	A1433		525		-	
695	A1434		527		16	
696	A1436		541		9	
697	A1437		466		8	
698	A1439		455		16	
699	A1443		570		15	
700	A1444	A1445 ¹	571		-	
701	A1446	A1447 ¹	500		15	
702	A1448	A1449 ¹	515		-	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
703	A1450		490		17	
704	A1452		527		15	
705	A1453	A1454 ¹	545		14	
706	A1455		461		14	
707	A1456	A1457 ¹	491		15	
708	A1458	A1459 ¹	466		15	
709	A1460		456		8	
710	A1461		511		9	
711	A1462		468		13	
712	A1463		468		7	
713	A1464		491		16	
714	A1469		524		14	
715	A1470		530		18	
716	A1471		491		15	
717	A1472		457		8	
718	A1473		551		14	
719	A1474		510		15	
720	A1475		503		14	
721	A1476		490		10	
722	A1477		505		14	
723	A1478		514		20	
724	A1479		491		18	
725	A1480		498		7	
726	A1483		555		-	
727	A1484		471		17	
728	A1485		464		9	
729	A1487		530		14	
730	A1488		448		7	
731	A1491		478		10	
732	A1492		470		6	
733	A1493		500		13	
734	A1494		467		13	
735	A1495	A1496 ¹	524		17	
736	A1500		504		7	
737	A1501		490		9	
738	A1502		500		13	
739	A1503		524		17	
740	A1505		500		12	
741	A1506		491		6	
742	A1507		541		15	
743	A1508		643		21	
744	A1509		577		11	
745	A1510		501		13	
746	A1511		497		-	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
747	A1512		515		12	
748	A1513		497		7	
749	A1514		480		15	
750	A1515		519		14	
751	A1517		444		7	
752	A1518		435		6	
753	A1519		558		15	
754	A1521		508		8	
755	A1522		497		16	
756	A1524		504		15	
757	A1525		513		10	
758	A1526		509		13	
759	A1527		470		10	
760	A1528		483		15	
761	A1529		496		10	
762	A1530		502		17	
763	A1531		530		17	
764	A1532		523		9	
765	A1533		481		12	
766	A1534		493		16	
767	A1535		527		13	
768	A1536		454		14	
769	A1537	A1538 ¹	488		12	
770	A1539		492		14	
771	A1540		560		19	
772	A1541		501		-	
773	A1542		511		10	
774	A1543		467		7	
775	A1544		481		9	
776	A1545		556		10	
777	A1546		474		7	
778	A1547		507		11	
779	A1548		473		10	
780	A1549		502		7	
781	A1550		503		9	
782	A1551		506		15	
783	A1552		507		18	
784	A1553		507		9	
785	A1554		500		7	
786	A1556		512		15	
787	A1557		483		10	
788	A1558		486		10	
789	A1559		508		8	
790	A1560		503		10	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
791	A1561		487		15	
792	A1563		506		15	
793	A1564		497		12	
794	A1565		510		8	
795	A1566		529		14	
796	A1567		531		9	
797	A1568		510		16	
798	A1569		492		-	
799	A1571		439		10	
800	A1572		452		10	
801	A1574		480		14	
802	A1576		445		8	
803	A1578		492		-	
804	A1579		594		-	
805	A1580		542		14	
806	A1581		505		-	
807	A1582		467		19	
808	A1583		555		9	
809	A1584		505		13	
810	A1585		455		15	
811	A1586		501		14	
812	A1587		529		11	
813	A1588		458		17	
814	A1589		510		13	
815	A1590		520		19	
816	A1591		492		7	
817	A1592	A1593 [†]	535		16	
818	A1594	A1595 [†]	535		20	
819	A1596	A1597 [†]	504		9	
820	A1598	A1599 [†]	513		12	
821	A1600		476		14	
822	A1601		547		-	
823	A1602	A1603 [†]	470		15	
824	A1604		536		13	
825	A1605		525		14	
826	A1606		495		8	
827	A1607	A1608 [†]	503		11	
828	A1609	A1610 [†]	445		14	
829	A1611	A1612 [†]	517		15	
830	A1613		436	1200	7	
831	A1614	A1615 [†]	478	1500	9	
832	A1616	A1617 [†]	494	2100	9	
833	A1618		486	1750	8	
834	A1619	A1620 [†]	482	1800	12	

Appendix 2. Continued.

No	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
835	A1621	A1622 ¹	524	1950	13	
836	A1623	A1624 ¹	491	2000	8	
837	A1628		607	2950	-	
838	A1629		526	2500	-	
839	A1630		475	1875	12	
840	A1631		477	1750	10	
841	A1632	A1633 ¹	483	1950	10	
842	A1635	A1636 ¹	510	2450	14	
843	A1639		486	1750	14	
844	A1640		452	1650	9	
845	A1641	A1642 ¹	448	1500	7	
846	A1643		486	1700	-	
847	A1644	A1645 ¹	536	2700	15	
848	A1646	A1647 ¹	464	1700	-	
849	A1650	A1651 ¹	564	2750	15	
850	A1652		524	2450	15	
851	A1653		493	2000	9	
852	A1654	A1655 ¹	520	2200	16	
853	A1656	A1657 ¹	480	2000	9	
854	A1658	A1659 ¹	494	1750	16	
855	A1664	A1665 ¹	510	2500	15	
856	A1666	A1667 ¹	487	1900	14	
857	A1668	A1669 ¹	493	1950	13	
858	A1670	A1671 ¹	456	1700	7	
859	A1672	A1673 ¹	505	1800	16	
860	A1678		490	1650	14	
861	A1679		498	2050	15	
862	A1680		475	1600	15	
863	A1681		500	2750	9	
864	A1682		481	2100	9	
865	A1683		486	2000	14	
866	A1684	A1685 ¹	515	2200	9	
867	A1686		456	1600	21	
868	A1687	A1688 ¹	492	2050	15	
869	A1689	A1690 ¹	473	1750	13	
870	A1691	A1692 ¹	522	2350	17	
871	A1694		536	2200	16	
872	A1695	A1696 ¹	490	1800	12	
873	A1697		515	2350	7	
874	A1698		527	2400	15	
875	A1699		450	1700	8	
876	A1700		478	1750	10	
877	A1701		519	2100	13	
878	A1702		489	1700	12	

Appendix 2. Continued

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
879	A1703		468	1700	11	
880	A1704		488	1850	13	
881	A1705		520	2300	11	
882	A1706		452	1400	7	
883	A1709		490	2100	14	
884	A1710		452	1550	8	
885	A1711		500	2300	20	
886	A1712		500	1800	14	
887	A1714		522	2100	11	
888	A1715		488	1700	13	
889	A1716		482	1900	13	
890	A1717		475	2100	7	
891	A1718		475	2000	18	
892	A1720		575	2800	14	
893	A1721		514	2500	11	
894	A1722		514	2250	16	
895	A1723		497	1950	12	
896	A1724		498	1850	23	
897	A1725		424	1400	6	
898	A1726		529	2600	20	
899	A1727	A1728 ¹	465	1850	10	
900	A1732		530	2150	15	
901	A1733		515	2100	17	
902	A1734		475	1650	8	
903	A1735		476	1700	19	
904	A1736		486	1850	17	
905	A1737		610	3900	15	
906	A1741		477	1750	11	
907	A1742		491	1900	15	
908	A1743		493	2000	16	
909	A1748		474	1950	14	
910	A1749		421	1150	5	
911	A1750		539	2550	17	
912	A1751		482	1950	7	
913	A1752		509	1900	19	
914	A1756		492	1950	14	
915	A1759		477	1900	10	
916	A1760		550	2800	18	
917	A1761		505	2200	8	
918	A1762		489	1950	9	
919	A1763		452	1450	6	
920	A1764		518	1950	14	
921	A1765		530	2600	15	
922	A1766		479	1750	15	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
923	A1767		500	2200	10	
924	A1769		490	1550	-	
925	A1770		502	2400	14	
926	A1771		542	2400	15	
927	A1772		487	1800	17	
928	A1775		452	1550	7	
929	A1776		475	1600	14	
930	A1777		481	1950	13	
931	A1778		493	2200	18	
932	A1779		468	1600	13	
933	A1780		525	2500	16	
934	A1783		568	2950	23	
935	A1784		480	1900	15	
936	A1786		518	2200	18	
937	A1787		481	2000	12	
938	A1788		-		14	
939	A1789		500	2000	19	
940	A1790		496	2300	13	
941	A1792		468	1600	9	
942	A1793		487	1850	-	
943	A1794		503	2150	11	
944	A1795		497	1795	12	
945	A1796		498	2350	10	
946	A1797		525	2500	9	
947	A1798		510	2150	13	
948	A1800	A1801 ¹	536	2650	12	
949	A1802	A1803 ¹	464	1750	15	
950	A1804		481	1950	15	
951	A1805		551	2850	15	
952	A1806		489	1700	9	
953	A1807		475	1900	19	
954	A1808		538	2750	17	
955	A1809	A1810 ¹	510	2200	15	
956	A1811	A1812 ¹	480	2050	14	
957	A1813	A1814 ¹	495	1800	17	recap'd, Arctic Red River, 15 Nov. 1993
958	A1815	A1816 ¹	491	1900	23	
959	A1817	A1818 ¹	487	2000	17	
960	A1819		532	2300	11	
961	A1820		468	1700	10	
962	A1822		464		10	
963	A1823	A1824 ¹	462		7	recap'd, Horseshoe Bend, 11 Sept. 1993
964	A1825	A1826 ¹	458		-	
965	A1827	A1828 ¹	458		14	recaptured, East Channel, 18 Jun. 1995
966	A1829		525		15	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
967	A1830	A1831 ¹	498		15	recaptured, Peel River, 26 Oct. 1995
968	A1833		495		12	
969	A1834		504		15	
970	A1835		509		18	
971	A1836		483		19	
972	A1837		536		10	
973	A1838		558		15	
974	A1839		480		15	
975	A1842		481		14	
976	A1843		461		14	
977	A1844		485		12	
978	A1845		461		15	
979	A1846		472		15	
980	A1847		530		16	
981	A1848		515		11	recap'd, Arctic Red River, 25 Oct. 1993
982	A1850		493		15	
983	A1851		482		15	
984	A1852		487		11	
985	A1853		500		14	
986	A1854		470		10	
987	A1855		442		7	
988	A1856		485		9	
989	A1859		495		11	
990	A1860		552		12	
991	A1861		438	1600	8	
992	A1862		507	2050	15	
993	A1863		493	1950	15	
994	A1864	A1865 ¹	460	1650	12	
995	A1866		502	1950	10	
996	A1867	A1868 ¹	573	2150	11	
997	A1869	A1870 ¹	507	2600	12	
998	A1871		476	1800	7	
999	A1872		517	2150	18	
1000	A1873		469	1650	16	
1001	A1874		511	1800	11	
1002	A1875		477	1800	19	
1003	A1876		519	2550	12	
1004	A1877		510	2350	-	
1005	A1878		489	2100	15	
1006	A1879		456	1450	13	
1007	A1880		487	2000	11	
1008	A1881	A1882 ¹	538	2200	15	
1009	A1883	A1884 ¹	532	2250	11	
1010	A1885		540	2500	14	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
1011	A1887		484	1600	15	recaptured, Horseshoe Bend, fall 1993
1012	A1888		454	1350	13	
1013	A1891		490	2100	8	
1014	A1892		491	1950	13	
1015	A1893	A1894 ¹	567	2700	13	
1016	A1895		472	1750	10	
1017	A1896		456	1600	12	recap'd, Arctic Red River, 24 Sept. 1993
1018	A1897		567	3150	15	
1019	A1898	A1899 ¹	494	1850	14	
1020	A1900	A1901 ¹	480	1850	13	
1021	A1902		529	2600	9	
1022	A1903		518	2150	11	
1023	A1904	A1905 ¹	465	1500	10	
1024	A1906	A1907 ¹	510	2150	-	
1025	A1910		486	1600	14	
1026	A1911		473	1850	8	
1027	A1912		483	1800	11	
1028	A1913		482	1800	7	
1029	A1914		585	3100	12	
1030	A1916		540	2700	14	
1031	A1917		495	1550	14	
1032	A1919		470	1700	17	
1033	A1920		500	1900	9	
1034	A1921		524	2100	11	
1035	A1922		494	1950	14	
1036	A1923		560	2800	-	
1037	A1924		467	1850	15	
1038	A1925		465	1500	14	
1039	A1926		478	1900	13	
1040	A1927		463	1500	15	
1041	A1928		460	1600	13	
1042	A1929		488	1950	8	
1043	A1930	A1931 ¹	586	3800	11	
1044	A1932		470	1600	10	
1045	A1934		451	1450	9	
1046	A1937		458	1650	7	
1047	A1938		506	2350	9	
1048	A1939		490	1950	8	
1049	A1940		508	2200	14	
1050	A1942		515	1900	7	
1051	A1943		517	2300	15	
1052	A1944		555	3050	13	
1053	A1945		468	1700	6	
1054	A1946		528	2400	13	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
1055	A1947		509	1900	13	
1056	A1948		442	1300	9	
1057	A1949		515	1950	13	
1058	A1950		519	2600	15	
1059	A1952		549	1500	9	
1060	A1953		463	1450	18	
1061	A1956		502	2050	9	
1062	A1957		504	2100	17	
1063	A1958		526	2850	14	
1064	A1959	A1960 ¹	475	1650	7	
1065	A1965		491	2000	9	
1066	A1967		509	2150	12	
1067	A1968		484	1950	12	
1068	A1969		480	1800	8	
1069	A1970		487	2150	12	
1070	A1971		505	1950	15	
1071	A1972		492	2000	11	
1072	A1973		472	1950	8	
1073	A1974		480	1900	10	
1074	A1975		483	1600	12	
1075	A1976		505	2300	15	
1076	A1977		459	1500	15	
1077	A1978	A1979 ¹	459	1850	8	
1078	A1980	A1981 ¹	550	2850	13	
1079	A1982		500	1900	15	
1080	A1983		560	2500	17	
1081	A1984		488	2150	9	
1082	A1985	A1986 ¹	510	2200	15	
1083	A1988		545	2650	-	
1084	A1989		529	2250	12	
1085	A1990	A1991 ¹	446	1450	9	
1086	A1992	A1993 ¹	516	2000	14	
1087	A1994	A1995 ¹	446	1400	13	
1088	A1996	A1997 ¹	444	1350	7	
1089	A1998		510	1850	12	
1090	A1999		515	2050	17	
1091	A2000		476	1650	16	
1092	A2001	A2002 ¹	559	2650	-	
1093	A2003	A2004 ¹	541	2450	13	
1094	A2005	A2006 ¹	465	1600	10	
1095	A2007	A2008 ¹	475	1800	12	
1096	A2009		564	2550	12	
1097	A2010		502	2250	11	
1098	A2011		498	2250	10	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
1099	A2013		508	2000	15	
1100	A2014		474	1950	10	
1101	A2015		462	1450	-	
1102	A2016		501	2000	15	
1103	A2017		521	2150	13	
1104	A2018		455	1500	7	
1105	A2019		512	2350	21	
1106	A2020		467	1650	12	
1107	A2021		483	1600	16	
1108	A2022		533	2750	17	
1109	A2023		511	2050	10	
1110	A2024		545	2600	12	
1111	A2025		472	1750	8	
1112	A2026		500	2300	13	
1113	A2027		508	2300	13	
1114	A2028		492	2000	14	
1115	A2029		500	1950	16	
1116	A2030		492	2050	18	
1117	A2031		486	1750	17	
1118	A2032		476	1950	11	
1119	A2033		478	1700	11	
1120	A2034		466	1500	-	
1121	A2036		526	2250	12	
1122	A2037		438	1500	8	
1123	A2038		486	1950	10	
1124	A2039		529	2700	-	
1125	A2040		495	1950	6	
1126	A2041		469	1700	10	
1127	A2042		534	2600	-	
1128	A2043		456	1300	9	
1129	A2044		498		9	
1130	A2045		460	1450	13	
1131	A2046		490	1850	11	
1132	A2047		531	2500	19	
1133	A2048		460	1350	11	recaptured, Pokiak Channel, Sept. 1995
1134	A2049		490	1800	11	
1135	A2050		508	1900	14	
1136	A2051		491	1650	15	
1137	A2052		575	3000	-	
1138	A2053		570	3300	12	
1139	A2054		466	1750	9	
1140	A2055		473	1750	15	
1141	A2057		514	2150	10	
1142	A2058		509	2050	15	recap'd, Horseshoe Bend, Sept. 1993

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
1143	A2059		500	1950	13	
1144	A2060		488	2100	8	
1145	A2061		516	1950	14	
1146	A2062		486	2150	7	
1147	A2063		485	2050	13	recap'd, Horseshoe Bend, 11 Sept. 1993
1148	A2064		460	1400	14	
1149	A2065		513	2100	14	
1150	A2066		533	2500	12	
1151	A2067		486	1950	16	
1152	A2068		490	1500	9	
1153	A2070		565	2750	16	
1154	A2071		484	2100	12	
1155	A2072		475	1800	9	
1156	A2073		540	2400	10	
1157	A2074		549	2550	22	
1158	A2075		511	2100	15	
1159	A2076		504	2000	16	
1160	A2077		492	1850	17	
1161	A2078		502	2300	9	
1162	A2079		495	1700	9	
1163	A2080		485	1650	12	
1164	A2081		451	1400	20	
1165	A2082		468	1400	15	
1166	A2083		481	1700	14	
1167	A2084		476	1650	11	
1168	A2085		498	1900	15	
1169	A2086		488	1650	13	
1170	A2089		486	1750	13	
1171	A2090		551	2700	13	
1172	A2092		465	1700	6	
1173	A2093		500	2000	11	
1174	A2094		474	1950	17	
1175	A2095		529	2300	11	
1176	A2096		480	1800	7	
1177	A2097		523	2150	9	
1178	A2098		454	1700	14	
1179	A2099		538	2500	14	
1180	A2100		545	2600	14	
1181	A2101		503	2100	8	
1182	A2103		535	2450	16	
1183	A2104		488	1750	10	
1184	A2106		488	2050	11	
1185	A2107		503	1900	10	
1186	A2108		498	2050	9	

Appendix 2. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
1187	A2109		472	1550	10	
1188	A2110		455	1500	11	
1189	A2111		500	2300	10	
1190	A2112		459	1700	15	
1191	A2113		484	1900	10	
1192	A2114		512	2100	13	
1193	A2115		477	1800	17	
1194	A2116		555	2400	13	
1195	A2118		473	1850	6	
1196	A2119		545	2400	13	
1197	A2120		483	1850	9	
1198	A2121		457	1750	9	
1199	A2122		444	1450	-	
1200	A2123		435	2550	13	
1201	A2124		489	2100	8	
1202	A2125		545	2300	11	
1203	A2126		447	1550	7	
1204	A2127		510	2400	10	
1205	A2128		529	2650	14	
1206	A2129		494	1950	-	
1207	A2130		502	1700	19	
1208	A2131		529	2100	14	
1209	A2132		515	2550	9	
1210	A2133		527	2250	16	
1211	A2134		505	1850	16	recap'd, Horseshoe Bend, 26 Sept. 1993
1212	A2135		530	2400	17	
1213	A2136		457	1550	8	
1214	A2137		486	1850	16	
1215	A2138		528	2000	-	
1216	A2139		525	2450	16	
1217	A2140		514	2100	14	
1218	A2141		472	1550	15	
1219	A2142		500	2050	15	
1220	A2143		540	2450	18	
1221	A2144		474	1550	13	
1222	A2145		510	2100	20	
1223	A2146		503	1850	8	

¹Fish injected with oxytetracycline.

Appendix 3. Tag numbers, fork lengths, weights and pelvic fin ray ages for inconnu tagged at Horseshoe Bend, NT, July - August, 1993.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
1	A0189		695		11	
2	A0219		751		12	
3	A0220		793		-	
4	A0222		705		14	recaptured, Arctic Red River, Aug. 1999
5	A0258		558		7	
6	A0259		827		-	
7	A0266		654		10	
8	A0292		875		-	
9	A0296		825		23	recaptured, Arctic Red River, 3 Aug. 1995
10	A0300		560		6	
11	A0306		751		15	
12	A0323		886		-	
13	A0326		704		15	
14	A0344		749		12	
15	A0342		805		15	
16	A1356		726		13	recaptured, Arctic Red River, 12 Oct. 1993
17	A0400		740		16	
18	A0362		655		9	
19	A0363		655		10	
20	A0376		806		16	recaptured, Peel River, Nov. 1993
21	A0378		723		10	
22	A0379		795		14	
23	A0388		795		13	
24	A0392		898		18	
25	A0394		843		18	
26	A0397		589		7	
27	A0407		644		11	
28	A0416		596		7	
29	A0418		570		6	
30	A0424		720		12	
31	A0425		738		15	
32	A0434		653		7	
33	A0442		628		11	
34	A0452		790		19	
35	A0455		640		9	
36	A0459		653		10	
37	A0460		652		10	
38	A0483		636		11	
39	A0488		749		13	
40	A0489		745		10	
41	A0490		610		6	
42	A0500		660		10	
43	A0507		726		13	

Appendix 3. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
44	A0521		828		13	
45	A0529		621		7	
46	A0530		786		14	
47	A0566		770		11	
48	A0576	A0577 ¹	551		6	
49	A0590		810		16	
50	A0613		834		18	
51	A0621		740		-	
52	A0623		732		16	
53	A0644		938		18	
54	A0646		656		10	
55	A0649		741		12	recaptured, East Channel, fall 1993
56	A0654	A0655 ¹	545		6	
57	A0656		770		17	
58	A0666		600		12	
59	A0667	A0668 ¹	607		7	
60	A0669		594		6	recaptured, Arctic Red River, 9 Oct. 1993
61	A0689		617	2200	9	
62	A0690		680	3100	15	
63	A0691		694	3000	13	
64	A0709		686	3350	11	
65	A0710		709	3250	15	
66	A0711		685	2700	12	
67	A0739	A0740 ¹	543	1550	7	
68	A0753		671	3350	9	recaptured, Arctic Red River, 10 Oct. 1993
69	A0754		715	3250	14	
70	A0770		707	3750	15	
71	A0783		720	3450	11	
72	A0794		742	4200	11	
73	A0799		636	2650	7	
74	A0809		633	2800	7	
75	A0817		832	6050	19	
76	A0827		735	4550	15	
77	A0863		685	3700	11	
78	A0874		782	5000	11	
79	A0877		901	9250	18	
80	A0879		600	1400	8	
81	A0939		790	5650	14	
82	A0991		732	3500	14	
83	A1268		728	3900	13	
84	A1269		844	5900	16	
85	A1272		686	3300	11	
86	A1280		746	4800	15	
87	A1287		700	3550	12	

Appendix 3. Continued.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
88	A1288		740	3800	15	
89	A1293		780	4000	13	
90	A1294		723	3400	15	
91	A1296		785	4700	15	
92	A1307		745	4200	13	
93	A1323		773	4600	17	
94	A1331		692	4400	14	
95	A1401		814		15	
96	A1402		656		12	
97	A1403		867		18	
98	A1408		758		14	
99	A1409		681		11	
100	A1410		710		18	
101	A1412		852		-	
102	A1413		746		15	
103	A1425		730		13	
104	A1426		678		12	
105	A1428		776		15	
106	A1429		668		11	
107	A1435		690		11	
108	A1440		706		13	
109	A1441		813		17	
110	A1442		600		7	
111	A1451		727		11	
112	A1465		736		11	
113	A1468		780		16	
114	A1482		710		13	
115	A1486		679		14	
116	A1497		574		7	
117	A1498		853		18	
118	A1499		749		14	
119	A1523		788		15	
120	A1555		575		8	
121	A1562		814		17	
122	A1626	A1627 ¹	803	5750	16	recap'd, Arctic Red River, 15 Aug. 1993
123	A1637		813	6050	19	
124	A1638		663	2900	11	
125	A1648	A1649 ¹	696	3325	9	
126	A1660		831	6200	20	
127	A1662	A1663 ¹	690	3250	15	
128	A1676		903	7700	25	
129	A1677		718	3600	13	
130	A1693		645	2650	10	recap'd, Thrasher Channel, 27 Apr. 1994
131	A1708		712	3400	13	
132	A1713		585	2400	6	
133	A1719		538	1700	5	

Appendix 3. Continued.

No.	Tag No	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
134	A1729		562	2750	6	
135	A1731		729	3850	13	
136	A1739		678	3000	13	
137	A1740		713	3850	12	
138	A1744		731	3750	17	
139	A1745		786	4750	15	
140	A1747		784	4800	17	
141	A1753		693	3450	13	
142	A1754		617	2400	8	
143	A1757		690	3450	14	
144	A1758		695	3000	16	
145	A1768		715	3500	13	recaptured, Horseshoe Bend, fall 1993
146	A1773		776	5000	13	
147	A1774		702	3300	15	
148	A1781		775	4800	20	
149	A1785		597	1950	10	
150	A1791		526	1300	6	
151	A1821		723		13	
152	A1832		755		14	
153	A1840		873		19	
154	A1841		545		6	recap'd 68°18'N, 134°02'W, 18 Jul. 1996
155	A1857		749		15	
156	A1858		636		9	
157	A1889		760	5150	12	
158	A1908		638	2450	9	recaptured, Horseshoe Bend, fall 1993
159	A1915		679	2850	11	recaptured, Horseshoe Bend, fall 1993
160	A1954		672	3000	10	
161	A1961		770	4400	15	
162	A1962		610	2150	10	
163	A1963	A1964 [†]	802	5150	16	
164	A2012		653	2850	8	
165	A2069		502	1100	6	
166	A2087	A2088 [†]	438	800	5	
167	A2091		674	3100	8	
168	A2105		556	1700	6	
169	A2147		538	1700	6	

[†] Fish injected with oxytetracycline.

Appendix 4. Tag numbers, fork lengths, weights and pelvic fin ray ages for Dolly Varden tagged at Aklavik, NT, August - September, 1992.

No.	Tag No.	Secondary Tag No.	Fork Length (mm)	Weight (g)	Age (yr+)	Comments
1	A0032		413	950		
2	A0043		496	1500		
3	A0053		321	400		
4	A0060		335	440		
5	A0061		366	480		recaptured, Husky Channel, 6 Aug. 1995
6	A0062		370	690		
7	A0065		415	950		
8	A0066		430	1030		
9	A0074		537	1750		
10	A0075		496	1500		
11	A0085		289	310		
12	A0146		520	1700		